

# ASTP ONBOARD VOICE TRANSCRIPTION

RECORDED ON THE COMMAND MODULE  
DATA STORAGE EQUIPMENT RECORDER

PREPARED BY  
TEST DIVISION  
PROGRAM OPERATIONS OFFICE

(NASA-TM-X-72912) ASTP ONBOARD VOICE  
TRANSCRIPTION (NASA) 673 p HC \$16.25

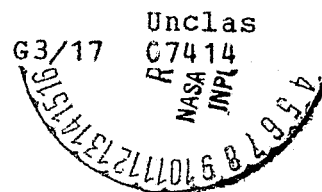
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*National Aeronautics and Space Administration*  
**LYNDON B. JOHNSON SPACE CENTER**  
*Houston, Texas*

SEPTEMBER 1975



## INTRODUCTION

This document is the transcription of the Apollo-Soyuz Test Project (ASTP) voice communications as recorded on the command module data storage equipment (DSE). Data from this recorder are telemetered (dumped) to Space Tracking and Data Network (STDN) sites for retransmission to the Johnson Space Center. The transcript is divided into three columns — time, speaker, and text. The Greenwich mean time (GMT) column consists of three two-digit numbers representing hours, minutes, and seconds (e.g., 22 34 14) for the Julian dates shown at the top of the page on which a new day begins. The speaker column indicates the source of a transmission; the text column contains the verbatim transcript of the communications.

A series of three dots (...) is used to designate those portions of the text that could not be transcribed because of garbling. One dash (-) is used to indicate a speaker's pause or a self-interruption and subsequent completion of a thought. Two dashes (- -) are used to indicate an interruption by another speaker or the point at which a recording was abruptly terminated. Words given unusual emphasis by the speaker are underlined. Three asterisks (\*\*\*) are used when clipping, static, or other electronic distortion obliterates the voice. Material enclosed within parentheses has been translated from Russian.

The ASTP mission began with the lift-off of command-service module 111 at 19:50:00.68 GMT (14:50:00.68 c.d.t.) on July 15, 1975. The crew splashed down in the Pacific Ocean at 21:18:27 GMT (14:18:27 c.d.t.) on July 24, 1975.

Speakers in the transcript may be identified as follows.

### Spacecraft:

ACDR	USA Commander (Thomas P. (Tom) Stafford)
CMP	USA Command Module Pilot (Vance D. Brand)
DMP	USA Docking Module Pilot (Donald K. (Deke) Slayton)
USA	USA unidentified spacecraft speaker
SCDR	USSR Commander (Alexey Leonov)
SFE	USSR Flight Engineer (Valeriy Kubasov)
USSR	USSR unidentified spacecraft speaker
MS	Multiple speakers

Mission Control Centers:

CC-H	USA CAP COMM (H = Houston)
CC-M	USSR CAP COMM (M = Moscow)
LCC	Launch Control Center
MCC-H	USA Mission Control speaker other than CAP COMM
MCC-M	USSR Mission Control speaker other than CAP COMM
PRESS	News media representative in building 2 auditorium

Other:

AA	Unidentified station
CT-(STA)	Comm tech (plus tracking station designation)
ELS	Earth landing system helicopter
NEW	USS <u>New Orleans</u>
PHOTO	Photographic helicopter
REC	Recovery helicopter
SWIM	Swim team helicopter

Suffixal designations (during transfer phases only)

-CM	Speaker in command module
-DM	Speaker in docking module
-OM	Speaker in orbital module
-DV	Speaker in descent vehicle

Transcription of these tapes was managed by Billie E. Johnson, Test Division, Program Operations Office, to whom inquiries regarding this document should be referred.

DAY 196

20 11 19 CC-H ... And ARIA is going to come up in about 55 minutes so we'll see you then.

ACDR Okay.

DMP Okay. And let's take a quick look at CMs on 181 there, Vance.

CMP Okay. Let's see.

ACDR ... flight time.

DMP Okay. CM, panel 181.

20 11 45 CMP Yeah. CM 1 POWER, OFF.

20 11 47 DMP Okay. Stand by till I get you that.

CMP Okay. You know, they didn't pack this bag with ...

DMP Understandable, I guess.

20 12 06 CMP Okay. Now, repeat what you want on 18 ...

DMP CM 1 TV STATION POWER, OFF.

20 12 15 CMP Okay; it's OFF.

20 12 16 DMP Okay. TAPE RECORDER, I get that. Then on 400.

CMP All right.

DMP HEAD WHEEL DRIVE MOTOR, ON. Light on?

20 12 25 CMP Okay; ON.

DMP TAPE DRIVE, REWIND.

20 12 29 DMP REWIND.

DMP Okay. Now, 226, circuit breaker COAS/TUNNEL LIGHT-ING MAIN B ...

CMP Say that one again.

DMP ...



CMP Yeah, I think I can. You see, the tunnel ...

DMP Yeah.

CMP Okay.

CMP Okay. Now say what it is again.

DMP On 226. Circuit breaker COAS/TUNNEL LIGHTING, MAIN B, CLOSED.

20 12 55 CMP CLOSED.

DMP Okay, then 230, OMNI, UP ..., I think. And 74 [sic].

CMP Let her go.

DMP SERVICE MODULE RCS QUAD HEATER A, SECONDARY.

20 13 10 CMP QUAD - QUAD HEATER light is ... HEATER A, SECONDARY.

DMP HEATERS B, C, D TO PRIMARY.

20 13 16 CMP All right that's done.

DMP Okay.

CMP But we still have to get 230.

DMP I'll get the 230 OMNI.

DMP Okay. Then. I got to stow the panel ... the circuit breakers ...

CMP Okay.

DMP Strut unlock lanyard, stow; unstow tool E - -

CMP Hey, yeah, just a second. Sometime - I guess maybe we ought to verify - -

DMP The S-IVB.

CMP - - these things.

DMP Yeah. I'm - I'm not ..., lanyard ... I'm not ...

DMP Yeah, the S-IVB ...

CMP Okay.

ACDR I'll get it.

DMP Tom, did you set up the COAS? Do you need the DAC?

CMP Do we need tool E yet?

ACDR I'll leave it there.

DMP ...

CMP We need you to set up the ORDEAL, Tom.

ACDR Yeah. ... I got ...

DMP Go ahead.

ACDR Already got my altitude set in, about ... average.

DMP Okay.

ACDR You got it? You got ... here?

CMP Okay. We've got it in ... And, ..., right?

ACDR Yeah. But we got to put us some tape on here.

20 14 42 CMP Okay; and we lost the telescope cover.

ACDR We're in good shape.

ACDR Okay; I ... do a VERB ...

CMP Okay. You need the tool E, Tom.

ACDR No, I don't.

CMP Okay. I'll leave it there, then.

DMP Stow - You're getting all this stow actuator for ...

DMP ... Yeah. I'll get that in a minute here. I was going ...

DMP ...

CMP Okay.

20 15 20 DMP The S-IVB's ... up to the vertical now.

CMP So that's the story.

DMP Yeah. It's sitting ... now.

MS (Laughter)

CMP ...

DMP Let me see, I got - I got the ORDEAL ballpark set up.

CMP Okay. Well, I'll wait for it.

DMP Better twist it around the other way.

CMP Okay. ...

DMP ...

ACDR Yeah.

20 15 41 CMP You know what's funny, seeing those optics coverers go.

DMP Yeah.

CMP I saw them leave and that was black and I thought they hadn't really gone.

DMP/ACDR Okay.

CMP Ready for the docking probe.

12 15 52 DMP Breakers are IN.

CMP Okay. I'll go EXTEND/RELEASE until full probe.

DMP Okay.

ACDR Got a barber pole. Okay, hold about 5 seconds ...

DMP Okay, then it says, just go full PROBE EXTEND ...

CMP Okay. Probe gray at full extension. Right.

DMP Yeah.

12 16 17 CMP ... gray ... Now, when you're through go to RETRACT.

DMP Okay.  
 CMP Okay. Next - next is going to be a MAIN REG check,  
 and I can get down there to help out for that.  
 DMP Okay.  
 CMP Then I'll do my P52.  
 ACDR All right.  
 CMP What time is it? It's 26, I can start that at 35.  
 ACDR ... along here, right?  
 DMP What?  
 ACDR I think ... everything on EXTEND PROBE.  
 DMP Okay.  
 CMP Yeah.  
 ACDR ... anything now?  
 CMP Yeah.  
 ACDR Okay.  
 DMP Get down there, let me ...  
 CMP Okay; go.  
 DMP Okay; ... MAIN REG B valve, CLOSED.  
 20 17 01 CMP B, CLOSED.  
 DMP EMERGENCY CABIN PRESSURE, select 1.  
 20 17 02 CMP 1.  
 DMP Test pushbutton, push.  
 20 17 04 CMP All right, here it comes.  
 DMP Okay. There you go ... Okay.  
 CMP All right.

DMP Okay. MAIN REG B valve, OPEN.  
 20 17 17 CMP OPEN.  
 DMP MAIN REG A valve, CLOSED.  
 20 17 20 CMP A, CLOSED.  
 DMP PRESSURE select 2.  
 20 17 22 CMP 2.  
 DMP Push to test.  
 20 17 24 CMP Push to test.  
 DMP Got that one?  
 CMP Yeah.  
 DMP MAIN REG A valve, OPEN.  
 20 17 30 CMP OPEN.  
 DMP CABIN PRESSURE select, BOTH.  
 20 17 47 CMP BOTH.  
 DMP ... that one.  
 CMP Okay. Anything else down there.  
 DMP Okay. Let me see here.  
 ACDR Vance, while you're there you can hand me the DAC.  
 I'll just put it ...  
 CMP All right.  
 DMP Okay. ... is monitoring okay.  
 CMP Right.  
 DMP Okay. And we need, on 377 - let's try - how do  
 you ... that.  
 CMP ... Hey, move your feet, Tom, I'll try to get it.

ACDR - if I can get it without moving my feet, here.

DMP Got it.

ACDR Now, get your camera gear.

CMP Okay.

DMP Okay. Let's get on to 377, Tom.

ACDR Okay. ... the flashlight.

CMP I think I'll just give you these three to begin with, Tom. Unless you want me to ... - -

ACDR Yeah. Oh, no. ... find it here. 377?

CMP 377.

ACDR Yeah, hang on.

20 18 55 ACDR Okay. I got ...

DMP Okay. Go ... GLYCOL, NORM - clockwise.

20 19 01 ACDR Go clockwise?

DMP That's right, 30 seconds.

ACDR Okay. How ... clockwise.

DMP Go ...

ACDR I don't have any I don't need.

DMP Hang on, let me - Found a little washer floating by here.

20 19 22 CMP Yeah. Okay, we need the 25-millimeter lens ...

DMP Do we? ...

ACDR Okay, Deke. Suppose to go which way?

DMP Clockwise, NORMAL.

20 19 30 ACDR Okay, clockwise ...

DMP ... then BYPASS, counterclockwise.

ACDR Yeah.

CMP Deke, I'm going to take the little portable timer and put it down here.

DMP Okay.

CMP If you ever need it, it'll be down here, right next to the optics on the left.

DMP Okay, ... BYPASS ...

20 20 02 ACDR BYPASS, counterclockwise. Okay.

DMP ...

CMP Okay, Deke, would you hold this for Tom?

DMP Okay. I'll be around there in just a second. Let me put this washer in my pocket.

DMP Okay. What do you want me to hold?

ACDR ...

CMP ... coming back.

DMP ...

CMP Tom, I've got to get by you.

ACDR Yeah. All right.

CMP ... Okay.

20 20 39 CMP Okay. We got the DAC stuff out, Tom.

ACDR All right. Good. Now - -

DMP Where you going?

ACDR - - the only thing - ... come around in through here. See if we can make it here. Okay. We should be ...

ACDR It's as bad in this thing as if we ... on the ground.

CMP What's that?

ACDR ...

CMP (Laughter) Is it really?

ACDR Yeah. Got to get down there and get the couches ... Okay. Ready.

CMP ...

20 21 50 CMP Let's see. Where did we - Oh, yeah. I know where the tape is.

DMP Yeah. I got extra tapes ...

ACDR Well, oh boy, ... it's one of the most important things we got.

DMP Here, I got one more under the couch here.

CMP Let's see - -

DMP Here it is back here.

ACDR Okay. That looks good.

CMP Why don't we -

ACDR Who wants some tape? I got some right here.

20 22 28 CMP Yeah. Just a second. This ... just came off.

DMP It cuts off by itself.

DMP Just a minute, that - tape is in there.

CMP Yeah. Okay. Can you give me just two pieces, Tom?

ACDR Okay. In work.

CMP Is it still daylight out?

ACDR Oh, no. We're not ...

DMP ... tape.

ACDR I got - I got it. ... mine. Vance, ... a piece of tape.



CMP Okay. Thanks.

ACDR Need another one.

CMP Yeah.

DMP Okay; now then. Let me see, ... went off. ...

ACDR Yeah.

CMP Boy, it does take a little dark adapting.

ACDR Okay. ... some lights down there.

20 23 56 DMP Okay; P52.

CMP Okay. Tom, I'm just about to get a ...

ACDR Oh you are. You're working on that ... then.

CMP Yes.

ACDR Okay.

CMP I think it was coming about now. Right about 35.

ACDR 35. Yeah.

20 24 18 CMP Okay; that was star 27, Alkaid; 43 coming next.  
Damn it.

ACDR ...

DMP No. We hold up until - -

20 24 57 CMP Okay. There's - That should do it. Okay. All balls.  
Here's your NOUN 93, ready to copy.

ACDR NOUN 93: minus 36, minus 1, and plus 137. Okay,  
and that's the SCS [?].

CMP Okay, are you still SCS [?]?

ACDR Oh yeah. ...

20 25 19 CMP Okay. ... torquing now at 20 - 35:20.

ACDR Okay. Got that.

DMP Tom, ready to start EMS ...?

ACDR All right.

DMP EMS MODE to STANDBY.

20 25 46 ACDR Yeah.

DMP EMS FUNCTION ...

20 25 50 ACDR Roger.

DMP ...

20 25 54 CMP Okay, and we got a good check on the star.

20 26 10 ACDR 1586.8. Got it.

DMP EMS MODE, NORMAL.

20 26 14 ACDR NORMAL.

DMP Okay. DELTA-V TEST.

20 26 16 ACDR TEST.

DMP Okay. ... on/off.

CMP We're down to 351 and ... even.

DMP Okay. ...

20 26 30 ACDR ... We're at minus 10.5, Deke.

DMP Okay. EMS MODE, STANDBY

20 26 40 ACDR Yeah.

DMP EMS FUNCTION DELTA-V ...

20 26 43 ACDR Yeah.

DMP Set DELTA-V indicator to minus - -

CMP Oh, Tom.

ACDR Yeah.

CMP I need tool E again.  
 ACDR All right. Stand by. Here it is.  
 CMP ...  
 ACDR Right here, Vance.  
 CMP Got it.  
 ACDR There you go.  
 DMP Okay.  
 20 27 05 CMP Okay, the POTABLE LANK - TANK INLET you want verified  
 OPEN?  
 DMP Verify it is OPEN, counterclockwise.  
 20 27 10 CMP Verified.  
 DMP Okay on 326.  
 CMP Yeah.  
 DMP GLYCOL RESERVOIR BYPASS valve, OPEN.  
 20 27 17 CMP GLYCOL RESERVOIR BYPASS, OPEN.  
 DMP Counterclockwise.  
 CMP Go.  
 DMP GLYCOL RESERVOIR OUT valve, CLOSED, clockwise.  
 20 27 24 CMP CLOSED.  
 DMP GLYCOL RESERVOIR IN valve, CLOSED, clockwise.  
 20 27 27 CMP CLOSED.  
 DMP PRIMARY ...  
 CMP Anything else down here? ...  
 DMP ...

DMP Okay. 379 shouldn't be bad.

ACDR That's right.

DMP PRIMARY ACCUMULATOR FILL valve, ON, counterclockwise.

ACDR Yeah. Oh wait. Vance, hand me that.

CMP Oh. You need the tool E again? Down to the left there.

DMP I think that fell down in there ...

CMP All right. ...

ACDR Okay; want to go to DELTA-V and NORMAL on that EMS test.

DMP Yeah, we stopped there. Go to DELTA-V and NORMAL, right.

ACDR Okay; I'm going to 379.

DMP Okay.

20 28 17 ACDR Okay. ... clockwise.

DMP Actually, I don't know whether we ought to do that, Tom, because ... 40 to 55 percent and we're at 45 now.

ACDR I don't either.

DMP Let's leave it alone.

ACDR Forget it.

DMP Okay; ECS RAD FLOW CONTROL, POWER. ...

20 28 38 ACDR Okay.

DMP PRIMARY GLYCOL to RAD; valve normal, push.

20 28 42 ACDR All right. Normal, push. Okay, in work.

DMP And RAD TEMP PRIMARY. ...

DMP ... Okay, talkback is gray.

CMP And - Okay.  
 20 29 06 DMP GLYCOL EVAP TEMP IN, AUTO.  
 20 29 08 CMP GLYCOL EVAP ... AUTO.  
 20 29 12 DMP POTABLE H<sub>2</sub>O HEATER, MAIN A.  
 CMP MAIN A, POTABLE HEATER.  
 DMP Circuit breaker - circuit breaker ... DUMP 2, CLOSED.  
 CMP ...  
 DMP Yeah. ...  
 ACDR Yeah, yeah. Think that's what it is.  
 DMP Okay. Vance, do we have that ... going to OFF? ...  
 CMP All right. ... STANDBY on that one, and ...  
 DMP Okay, the next thing we got, it says purge burn.  
 CMP Okay. Ready.  
 DMP RCS transfer to service module.  
 20 29 57 CMP Okay, transfer to service module.  
 DMP POWER NORMAL 1, OFF. Verify.  
 ACDR ...  
 CMP Okay. Say that one again.  
 DMP RHC POWER NORMAL 1, OFF. Verify. And 2, OFF.  
 CMP Okay. That's one for Tom. You got the NORMALs off there, Tom?  
 ACDR Say again.  
 DMP RHC power normal. 1 - Verify 1, OFF and 2, OFF.  
 20 30 19 ACDR NORMAL 1, OFF, and 2, OFF, verified.  
 DMP RHC POWER DIRECT, 1 and 2, MAIN A and B.

20 30 24 ACDR 1, 2.

DMP Okay, RHCs 1 and 2, ARMED.

20 30 28 ACDR ARMED.

DMP Okay, simultaneously command plus and minus, using hard stops. Plus or minus roll for 3 seconds.

CMP Okay, that'll come first.

20 30 40 CMP Okay, Deke. Plus or minus pitch, 1 second.

DMP Okay; then RHC 1 and 2, LOCKED.

20 30 58 CMP LOCKED.

DMP RHC POWER, NORMAL - NORMAL 2, AC/DC; RHC POWER DIRECT 1 and 2, OFF.

20 31 05 CMP Off, Deke.

DMP That's all of that.

CMP Okay. What next? RCS check, I'll bet.

CMP Oh, I better get down and get this damn camera ...

CMP Tom, have you got the DAC set up?

ACDR I have the DAC, it's all set. Let me have the ...

CMP Why don't you take it and tell me what you get, okay? Is that okay?

ACDR Okay.

ACDR CM RCS. Okay. Unstow the DAC, 25-millimeter lens. You got that?

CMP Okay.

ACDR ... select Hasselblad. 50-millimeter lens, RHC.

CMP It says the reflex. That's the - -

ACDR Okay. ... than that.

CMP That's the - -  
 ACDR ...  
 CMP Yeah, panel - -  
 ACDR I don't know.  
 CMP Okay, is that in the - B-5?  
 ACDR B-5.  
 CMP Let me get that last. I rather get the TV next.  
 ACDR All right. All right.  
 CMP Because we need that worse.  
 CMP Okay; how about the TV?  
 ACDR The TV, B-5?  
 CMP Yeah.  
 ACDR TV CM-4, TV zoom.  
 CMP Okay; let's do one thing at a time.  
 DMP Do you have everything up to ...?  
 ACDR I don't know. ... here.  
 20 32 52 CMP Okay, Tom.  
 ACDR Okay.  
 CMP Now, one at a time.  
 20 32 56 ACDR CM-4.  
 CMP What's that? Oh, that's a window.  
 ACDR Okay. ... the TV, you need the zoom lens, the monitor.  
 CMP All right, stand by; I'm going to hand these things to you.

ACDR I'll put them in here. Two cables and a U-mount.  
CMP Okay, it's really interesting.  
ACDR Assemble the U-mount and the cable on the camera ...  
CMP Let me get - I got - I'm going to have everything  
on a string here, if I'm lucky.  
ACDR All right. I got - I've got to go put a shade up.  
CMP Isn't this something?  
ACDR ... this God damned circuit breaker ...  
DMP Okay, Tom?  
ACDR Okay.  
DMP I'll put that stuff back in a minute.  
20 33 56 ACDR All right, I'll start getting it out.  
DMP Boy, am I glad to see ...  
ACDR Yeah.  
CMP It'd be all over the place here.  
CMP Okay. Now can I help you, Tom?  
ACDR ... Yeah.  
CMP Now I can take that and start handing it to you.  
ACDR All righty. First the camera - ... camera.  
CMP ... Okay, here's the camera.  
ACDR Okay. Can you get me the lens out of here, Vance?  
CMP Yep.  
ACDR Here's the bag.  
CMP Here's the lens.  
ACDR Okay, now ...



CMP Let me get all these bags ...  
 20 35 45 CMP You want me to get these out of your way?  
 ACDR Okay. Let me have the lens. ...  
 CMP Tell me what you need next.  
 ACDR Okay, get those - start getting those cables out of there.  
 CMP Okay, here's the monitor cable.  
 ACDR ... down here. ... got it ...  
 CMP ...  
 ACDR I've already got ... Just wrap it around that ... down there.  
 CMP Okay. Here's the TV cable.  
 ACDR Stand by, Vance.  
 CMP How are we running on time?  
 20 36 55 ACDR 46 minutes ...  
 CMP The only thing really - ...  
 ACDR Okay. Now, Vance, let me have ...  
 CMP That's the camera ...  
 ACDR That's in. Okay.  
 CMP Now, you need the monitor cable.  
 ACDR The monitor cable. ... the original ... of the camera.  
 CMP ... Now you've got cable, you've got lens. You've got about everything, Tom.  
 ACDR Okay. And it's hooked up.  
 20 37 38 DMP Let me check this caution and warning here. ...

ACDR All right. Go ahead. On the left, arrows pointing to the rear, left.

DMP I got it, Vance. ... over the side ...

ACDR Yeah. Okay. Vance, start hooking this camera.

CMP Okay. Maybe you should stick it in the window first and then I'll route it.

20 38 12 ACDR Okay the cameras are set.

CMP Okay. Deke, I guess it's in your window.

DMP Yeah.

ACDR Wait let me check just the rear part of this.

CMP Okay.

20 38 23 ACDR AVERAGE, SLAVE, and LINEAR; AVERAGE, SLAVE, and LINEAR. It's set.

CMP Okay; we're cased on the lens? Did you recheck it or -

ACDR Okay. Let me check the lens. Step 22, 12, and 15. ... Okay. It says here, Vance - -

DMP I'll probably have to get a light or ... in here a second.

ACDR Okay. That goes in 605.

CMP Okay, f/22.

ACDR Yeah.

CMP 25 and - -

ACDR 15.

CMP 15?

ACDR Yeah. I think it's all set.

20 38 55 CMP Yeah, it's set.

ACDR      Okay. Deke, ...

DMP      I'm going to have to ...

ACDR      Might take it over there and ...

20 39 04    CMP      Yeah, why don't you do that.

ACDR      Okay. That's back in 605.

DMP      Okay.

DMP      ...

ACDR      Everything.

DMP      We'll take the worse one. We'll take the camera -  
the bracket.

CMP      The camera or the bracket?

DMP      The bracket.

CMP      The camera's in the window.

DMP      ... screw this down a little bit?

CMP      Well, let's see what we got here ...

DMP      Yeah.

CMP      Okay. I'll put the camera back.

DMP      Put the camera back.

DMP      Okay, now then, ...?

20 40 17    CMP      Yeah. Everything's set, Deke. All you have to do is  
put it in.

DMP      All we have to do is ...

CMP      Yeah, it's got to go around the right side, Deke.

DMP      Yeah. Down ...

DMP      ... got the monitor all set up.

CMP Okay. What lens do we want on the Hasselblad, Tom.  
 I think it's one that's right here.

ACDR Okay. Let's see ... Set it for ...

CMP Okay. Actuate camera, verify camera ...

DMP Does it say we're supposed to put this camera in  
 yet ....?

20 41 30 CMP This zero-g business is really something.

DMP Yeah, it is.

DMP How are we coming on time, Tom?

ACDR We've got 20 minutes ...

DMP Okay.

CMP Okay, here's your camera.

DMP Hey ...

20 42 25 CMP Sure. And here's your ...

DMP ...

CMP You want to put it next to the hatch or someplace?

20 42 33 ACDR Ideal place for this little mother.

CMP Yeah, I think we've got everything pretty well in  
 shape here.

ACDR ... come on back up here and do a ...

DMP Okay, do you want to get this hookup down there ...?

CMP Yeah, I'll get it.

DMP Okay. I'll get back up on the couch.

CMP In the meantime, Tom, ... here's a couple of springs  
 for the ...

ACDR Okay.

CMP Okay, Deke.  
 DMP Okay. ...  
 CMP Okay, hand me the cable. Okay, this goes, would you describe it - it goes to CM 2 ...  
 DMP All right.  
 ACDR I'll hand it to you in a second.  
 20 43 21 DMP Panel 181 CM STATION POWER, OFF.  
 CMP Just a second, Deke, CM TV STATION 2.  
 DMP I think the POWER's OFF.  
 CMP Is it STATION 2?  
 DMP Yeah. CM 2 STATION - -  
 20 43 38 CMP Okay, that's all I wanted to know. Okay, POWER's OFF.  
 DMP Yeah. CM ... STATION receptacle.  
 CMP Okay. I've got to disconnect - -  
 ACDR That white connector down there.  
 CMP - - one other ...  
 DMP Disconnect DM ...  
 ACDR That's that white one.  
 DMP Yeah. Now there's something ... I never knew we had - -  
 ACDR There's the ...  
 DMP - - that kind of a ...  
 DMP It says secure the utility strap in R-5.  
 CMP Secure what, Deke?  
 DMP Secure it with the \*\*\*

CC-H Apollo, Houston through ARIA. How do you read?

ACDR Roger. Through ARIA. We're busy on page 15 - page 3-7 of the checklist and the S-IVB maneuver.

20 44 30 CC-H Roger, Tom. The comm is pretty bad here. Tell me again what page on the checklist you are.

20 44 35 ACDR 3-7.

DMP ...

CC-H Okay. And we'll be standing by.

ACDR ... We haven't completed parts of 2-4, 5, and 6 in the list.

CC-H Okay.

CMP Okay, the command's TV's hooked up. Now the utility strap, I guess I don't understand.

DMP Well, I don't ... The utility strap from R-5 was to secure what you disconnect down there.

20 45 00 CMP Oh, okay.

DMP ...

DMP And CM/DM CAMERA POWER, ON, up.

20 45 11 CMP Stand by. CM/DM CAMERA POWER is verified ON.

DMP TV AMPLIFIER, ON.

20 45 18 CMP AMPLIFIER, ON.

DMP CM 1 TV STATION POWER, ON.

20 45 27 CMP CM 1 TV STATION POWER, ON.

DMP CM 2 TV STATION POWER, ON.

20 45 32 CMP CM 2 TV STATION POWER, ON.

DMP TV STATION SELECT CM to CM.

20 45 35 CMP Okay, it's CM. And do they want CM 1 or 2?

DMP TV STATION SELECT CM 1, CM 1.

20 45 40 CMP CM 1.

DMP Check monitors and adjust camera pointing and lens if required.

CMP ... something to look at it.

DMP Okay. That takes care of all of that.

CMP Okay.

DMP Now, you got the DAC all set up?

ACDR The DAC is set up ...

DMP Okay.

DMP And, only thing, Vance, is that ... cable connector ...

CMP Well, there's supposed to be a routing for the TV cable.

DMP There is?

DMP Okay. The next thing we need out is the HRC.

20 46 11 CMP It's out.

DMP All right. Magazine 6 on camera.

CMP Yeah.

DMP 50-millimeter lens.

CMP I got them.

CMP Cotton pickin' hoses are getting out of here.

DMP Sure are a pain in the ass. Thank you.

20 46 38 CMP I go down there and I twist around.

DMP Go back and pick up systems checks here.

CMP Okay. Go ahead.

DMP Okay, service module RCS monitoring check.  
 CMP Go.  
 DMP SERVICE MODULE RCS QUAD HELIUM, four, talkback gray.  
 20 46 56 CMP Gray.  
 DMP SERVICE MODULE RCS PROPELLANT, eight, talkback gray.  
 20 47 00 CMP Gray.  
 DMP SERVICE MODULE RCS PSM PROPELLANT, four, talkback barberpole.  
 20 47 05 CMP I can certify that's barberpole.  
 DMP And SERVICE MODULE RCS PSM HELIUM, talkback barberpole.  
 20 47 13 CMP Okay, HELIUM's barberpole.  
 DMP CM[sic] RCS PSM MANIFOLD ISOL, talkback, gray.  
 20 47 19 CMP Okay, gray.  
 DMP Okay, RCS INDICATOR selector SM A, B, C, D, and PSM and on all of them you want to check package temp - -  
 20 47 26 CMP Okay, package temps are all - -  
 DMP - - 115 to 175 - -  
 CMP - - within the correct range.  
 DMP - - PSM zero.  
 20 47 36 CMP And PSM is zero.  
 DMP HELIUM PRESSURE, 4100 to 4200.  
 20 47 42 CMP Okay. And they all are.  
 DMP SECONDARY FUEL PRESSURE 178 to 192; PSM 130 to 150.  
 20 47 55 CMP Okay, PSM 130 to 150. On the SECONDARY -  
 20 48 00 DMP Okay.



CMP Wait a minute; I don't know about that.

DMP SECONDARY FUEL PRESSURE, 178 to 192.

CMP Oh, we don't have SECONDARY on PSM. Okay. Okay, now where are you?

20 48 12 DMP Okay. ... HELIUM TANK TEMP.

CMP All right, and which one on the - Okay, what should the TEMP be?

DMP It doesn't say.

20 48 25 CMP Okay. Well, it's - I think it's all right. Okay.

DMP Okay. SERVICE MODULE RCS INDICATOR switch PROPELLANT QUANTITY. Check quantity.

CMP Quantity.

DMP ...

CMP Well, it's high ...

DMP That's okay.

CMP Okay, that's all good.

DMP That's good. Let's go to CM RCS monitoring.

CMP Yeah.

DMP CM RCS PROPELLANT talkback, two, gray.

20 48 43 CMP Two, gray.

DMP Okay, select CM 1 and 2. Check the TEMP, the PRESSURE ... 80 ...

20 48 50 CMP Okay, that's good.

DMP HELIUM PRESSURE is ...

20 48 55 CMP That's good.

DMP Manifold pressure on 80 to 105.

20 48 59 CMP Okay. 80 to 105 is good.

DMP Great. Right on the nose.

DMP Okay. EPS monitoring. ... right over here. If I can get down here.

DMP You may want to take that one.

CMP What's that?

DMP ... on my side ... I can ... secondary glycol loop check.

ACDR Okay, well that's coming up in the next few minutes ...

20 49 29 CMP Okay.

DMP ... Why don't we terminate ...? Can we do that, Tom, and not screw it all up?

ACDR All right ... a few minutes.

CMP Good idea and - -

DMP ...

CMP I've got a feeling that we may have skipped some stuff after that, better go back and check the check-marks.

20 49 51 DMP Right. I got to ...

DMP Okay, so we're at 5 minutes?

ACDR Yeah, about 1 hour.

DMP Pardon?

ACDR We're at 1 hour.

DMP 1 hour ... I'm suppose to ... 8 - 9 minutes.

CMP Can I help you on the sequence?

ACDR Yeah, I tell you what, I've already done a bunch of the switch list. I've already ...

20 50 18 DMP 1:01:14.

CMP Okay. 16, MAIN A, MAIN B.

ACDR Go.

CMP Okay, CAL - COAS POWER, ON, up.

20 50 25 ACDR Okay, got it.

CMP Have you got minus 100 in the ...

ACDR Yes. Yeah.

20 50 29 CC-H Apollo, Houston. We are 1 minute from LOS ARIA. I'll give you a call at Vanguard in an hour and 12 minutes.

20 50 35 ACDR Roger. Okay.

CMP EMS FUNCTION, DELTA-V.

20 50 38 DMP Go.

CMP RATES - MAN ATT to RATE COMMAND.

20 50 41 ACDR Yes. Go.

CMP ATT DEADBAND, MIN/HIGH; THC POWER, ON.

20 50 43 ACDR THC POWER is ON.

CMP RHC POWER, NORMAL, 2; AC/DC and DIRECT, number 2 MAIN A, MAIN B.

20 50 46 ACDR And DIRECT number 2. Okay.

CMP You got NORMAL and DIRECT. BMAG MODE, three, to RATE 2.

20 50 59 ACDR RATE 2.

CMP RCS TRANSFER, SM, and I'll do that again.

ACDR Yeah, I ...

20 51 09 CMP Okay, I'll do it again. We've got eight talkbacks. Okay, got to load the DAP. Have you loaded the DAP?

ACDR Yeah, but recheck it ...

DMP ...

20 51 26 ACDR This comm is pretty bad, just wait until we're over Vanguard.

20 51 32 CMP Okay, did a VERB 46 ENTER; now a VERB 16 NOUN 17. You got - we have to load that.

ACDR You got all of that? ...

CMP Huh?

ACDR ...

20 51 56 DMP What the hell was that vibration?

ACDR ...

CMP Okay, that's 359, 196, and 1.

DMP Okay.

CMP NOUN 22.

20 52 13 CMP What was that just then? I saw something go by in a rush.

ACDR Looks like a big bunch of shit coming out of the S-IVB.

DMP I see kind of - looks like ion glow out there.

ACDR Yeah. ... coming down the S-IVB. ...

CMP Okay, VERB 63, as they were at the attitude, how are the needles?

ACDR ...

CMP Okay. So, by 49 we should have maneuvered; 59, that's nonpropulsive vent.

ACDR Yeah.

CMP 59, S-IVB maneuver complete. We do have nulled needles.

20 52 52 ACDR Yep.

CMP Thank God.

ACDR Yeah.

CMP Okay, CM separation. Okay, I'll start getting ready on this.

ACDR All right.

CMP Set DET counting up to SEP. That's at 1:14.

20 53 03 ACDR I've done that.

CMP Okay. ATTITUDE SET thumbwheels - 0, 180, 0.

20 53 09 ACDR Okay, I've already done that.

CMP 0, 180, 0.

ACDR Okay.

CMP Okay. CB RCS LOGIC, two, OPEN.

20 53 23 DMP Circuit breaker RCS LOGIC, two, OPEN.

CMP CB SEQ LOGIC, two, CLOSE; verify.

20 53 30 DMP SEQ LOGIC, two, CLOSED.

CMP CB SEQ ARM, two, CLOSE.

20 53 35 DMP SEQ ARM, two, CLOSE.

CMP SEQ LOGIC switches, two, ON, up.

20 53 39 DMP One, up; two, up.

CMP Okay. ARM your RCS and THC.

20 53 45 DMP Okay. THC is ARMED, ARMED.

CMP I'm going to call a VERB 49.

20 53 52 DMP Okay.

CMP And what is our attitudes.

DMP ...

20 53 57 CMP Okay. And, Deke, I'm going to get you a FUEL CELL REACS VALVES to LATCH. And ... GDC ALIGNED.

DMP Okay.

CMP We're standing by for 56.

DMP Okay.

20 54 05 CMP That's good. Okay. How's our monitor look? Where the hell is that?

20 54 34 DMP ... monitor?

CMP Yeah. Yeah, here it is.

DMP Here it is.

CMP ... see if you see anything.

CMP ... out of the way.

DMP Feel that vibration?

CMP Yeah. Well, I wouldn't say that it's great, but it doesn't particularly ... However, it's ...

DMP I'd say that looks like the ... out the window, doesn't it?

CMP ...

DMP ...

20 55 02 CMP Yeah. Yeah. ... in position. Okay, now let's see, where's the checklist?

CMP ... these monitors somewhere ...

DMP ...

CMP Going down to 350.

DMP Yeah. ... the hatch, Vance.

CMP Yeah, I think so.

DMP Right there.

20 55 43 CMP Somewhere, maybe. Actually, it's not a very good ...

20 56 01 CMP How ... our time's doing, Tom?

ACDR We've got about 8 minutes to go.

DMP ...

CMP Yeah, uh huh. And, Deke.

DMP Yeah.

CMP If you don't mind, I'll let you try to ... that monitor.

DMP Okay.

CMP ...?

DMP In my pocket.

CMP Okay, let me get it. Here.

20 57 03 CMP Okay. ... for the book.

CMP I need help.

DMP Okay. Maybe we can write in the other one.

CMP It doesn't matter.

ACDR You want one of these, Deke?

CMP Okay.

DMP We already got the VERB 49 in?

CMP Yes, sir.

DMP All right.

CMP At 56, you're going to put the TVC SERVO POWER on, and I'm going to go down and hit the CM panel - panel 400 ... And at 58, I'm going to go to CM 2 ... And Deke's got ... PYRO, ARM.

20 57 49    CMP    Okay. You got about 3 minutes 10 seconds to go. So let's ... 14 - we've got 4 - 16 minutes. ...

             DMP    ...

             CMP    Okay. There's a black sky out there.

             ACDR    It is black.

             DMP    I think we're over the horizon there.

             ACDR    No. There it is. ... what's going on ...

             DMP    ... out there.

             CMP    ... S-IVB.

             DMP    Some little ... gadget there. Right outside the window.

             CMP    That's that ...

             CMP    Oh, the ... picking up here. ... right of the command module ...

             CMP    Okay.

             DMP    Okay. Well, let's see ...

20 59 07    CMP    Okay, Tom, why don't you put this TVC SERVO POWER 1 to AC 1/MAIN A. I'll go down and - -

             ACDR    Okay. TV SERVO POWER 1 ...

             CMP    Panel 400.

             ACDR    I got it. Where'd you put the monitor, Vance?

             CMP    It's up - -

             ACDR    Oh, almost -

             CMP    - - behind you.

             ACDR    Oh, okay.

             DMP    Okay. .... work on that camera.



CMP And the silver camera - is that thing out?

DMP Yeah, I got the silver camera. ... on the hatch ...

CMP Good. Maybe I can use it if I get a chance. Okay.  
Are we at 56, Tom?

ACDR Yeah, 55:31.

20 59 49 DMP Okay. HEAD WHEEL MOTOR, DRIVE, Vance.

20 59 53 CMP I'm going to turn it to RECORD. And I'm just going  
to stay down here so that I can get this thing to  
CM 2.

DMP ...

CMP ...

DMP Hey, look at those stars. That's not stars, is it?

DMP ..., Deke.

DMP Well, I'll tell you, I just came ... this monitor.  
I think I can tell more when I put it out the  
window ...

CMP It's black out there right now.

DMP I want to ... what I can see looking out the window.  
...

ACDR ... looking real good ...

CMP Okay.

DMP I think the Velcro works beautiful. ...

CMP The lens is set up, right?

DMP Check it.

CMP Okay.

DMP ...

DMP Sure glad we had them tape that stuff, Tom.

21 01 05 CMP Here we go into CM 2 and what else was there to do down here? Was that all?

ACDR I think so.

DMP CM 2?

ACDR Yeah, that was all.

DMP ... TAPE RECORDER: HIGH BIT RATE, RECORD, FORWARD, COMMAND, RESET. Stand by on the PYROs.

CMP ... that high bit rate ...

ACDR Yeah. We - we got everything done except the ...

DMP Okay. ...

21 01 32 CMP Okay. We're at 57:30.

ACDR Okay. I'm going back to INERTIAL on the ...

21 01 49 CMP You got the PYROs, ARMed?

ACDR Okay.

CMP Yeah.

21 01 53 ACDR Okay. ... PYRO A, ARMed; B, ARMed.

21 01 57 CMP Okay, and tape recorder ... You got HIGH BIT RATE, RECORD -

21 02 06 ACDR - attitude and we're going to be doing a TD&E in 2 minutes, Dick. We're set up at 58:08 and counting.

CC-H Okay, Tom. Super. And, Deke, a reminder on the TV camera. We don't have any way of monitoring it on the VTR, so when you get turned around and get a monitor picture, you might select the f-stop as required and also PEAK instead of AVERAGE, if that's required.

21 02 30 DMP Okay. We're sitting here looking at the monitor now, of coarse, we're not seeing much in it. We'll keep an eye on it.

CC-H Roger. Understand.

21 02 38 CMP Okay, Tom, did you want to talk to ground? At 59:30 we'll go to EMS MODE, NORMAL, and I'll hit RCS COM-MAND, ON.

ACDR All right.

21 02 45 CMP Not yet. And at 59:58, you're going to thrust plus-X. At zero, you're going to hit the CSM LAUNCH VEHICLE SEP pushbutton.

CMP Yeah.

21 07 01 ACDR CMC in AUTO. Okay, ... maneuver.

CMP Damn, wish that ... would stop.

ACDR Something is stopping now.

21 07 08 CC-H Apollo, Houston. We are about 30 seconds from LOS. I'll give you a call - real short pass at Rosman at 6 - at 1 plus 38.

CMP Roger.

ACDR And I finally got the COAS back in, finally.

CMP Okay, good.

CC-H Roger, Tom.

21 07 34 CMP Okay. If you need the camera ever, let me know.

ACDR No, I'm too busy. Oh, that scared the hell out of me.

CMP I think we hit the hand controller.

DMP All I'm trying to do is keep the TV pointed ... If you need me to do anything else, holler.

ACDR Ah ha, now we're going to get it.

CMP Okay, good.

21 08 05 ACDR It's so much better in the simulator.

CMP Yeah.

ACDR Okay, stand by.

CMP ...  
 21 08 30 ACDR Stand by.  
 CMP Okay.  
 ACDR Don't say nothing, I'm concentrating on ...  
 21 09 30 ACDR ... getting cold ...  
 21 09 38 DMP ... cold ...  
 ACDR ...  
 CMP Okay. ... you're hard docked.  
 ACDR Right about there.  
 21 10 08 ACDR Got contact.  
 CMP CAPTURE. CAPTURE. CMC, FREE. No, CMC, FREE.  
 21 10 13 ACDR CMC, FREE.  
 CMP Okay, good. (Laughter)  
 ACDR PROBE, RETRACT.  
 CMP Give her 10 seconds.  
 ACDR Roll looks beautiful. Roll is right.  
 CMP Okay. If you're ready, I'll RETRACT.  
 ACDR Okay, RETRACT.  
 21 10 27 CMP RETRACT.  
 21 10 32 CMP PRIM 1. Do you see it coming in?  
 ACDR Yeah. It's coming in.  
 21 10 36 DMP Crunch.  
 21 10 38 ACDR And we've got a hard dock.  
 CMP Oh man; good deal. (Laughter) Crunch. Crunch.

21 10 43 CMP Okay. We got talkbacks gray and it's beautiful.  
ACDR ... hard dock.

21 10 47 CMP Okay. EXTEND RELEASE; coming OFF. And - -  
ACDR (Laughter)  
CMP - - RETRACT is OFF; PYRO ARM, SAFE, Tom.

21 10 56 ACDR Okay. PYRO ARM, SAFE. All right.  
CMP SECS LOGIC two, OFF.

21 11 00 ACDR Roger. Two, OFF.  
CMP EDS POWER, OFF.

21 11 03 ACDR EDS POWER, OFF. Go.

21 11 14 CMP Okay. TVC SERVO POWER, one, OFF.

21 11 16 ACDR Yeah.  
CMP Okay. Panel 8, CB RCS LOGIC, two, OPEN.

21 11 22 ACDR CB RCS LOGIC, two, OPEN.  
CMP CB DOCKING PROBE, two, OPEN.

21 11 26 ACDR DOCKING PROBE ...  
CMP Okay. Next page. We're going great!  
ACDR Yeah. (Laughter)

21 11 34 CMP Oh man, am I glad to be past this.  
ACDR Son of a bitch.

21 11 39 CMP Okay. CB (Laughter) - CB EDS, three, OPEN.  
MS (Laughter)

21 11 44 ACDR Okay. Circuit breaker EDS 1, 2, 3, OPEN.  
CMP COAS POWER, OFF.

21 11 50 ACDR COAS POWER, OFF.  
CM EMS, OFF/STANDBY.

21 11 52 ACDR EMS, OFF/STANDBY.

21 11 54 CMP Launch vehicle SPS INDICATOR switch to GPI.

21 12 00 ACDR All right. GPI.  
CMP THC and RHC, LOCKED.

21 12 05 ACDR Okay. We're LOCKED.  
CMP You already stopped the DAC. And, I think, PCM BIT RATE, LOW. I'll get the - -  
DMP Little nervous there, eh?  
ACDR Well, you see, we started INERTIAL ... comes around ... pressure ... pitching up, and ... the harness and the Earth, but I couldn't see the COAS. Like the shade of Gemini 9.  
CMP Yeah. Hey, Tom?  
ACDR Yeah?

21 12 31 CMP You know when we were coming around, I just didn't realize the big difference between your window and mine. That's why I was telling you, watch it keep coming. Because it was coming out of my window. And I guess it's - probably that I hit the hand control and that gave us the ...  
ACDR All right.  
CMP Okay. ...

21 12 52 ACDR Okay. You want us to go ...

21 13 01 CMP Man, I feel that ...  
ACDR Oh, man. ...  
CMP Hey, Deke, I got to get down there.  
DMP Okay.

DMP God damn, looks ...

MS ...

CMP What are you looking for?

DMP ... there's a big ...

CMP ...

ACDR ... a panel.

MS Yeah, yeah.

ACDR We're supposed to ...

CMP ...

ACDR Go ahead.

CMP ...

21 14 32 ACDR ... panel over here, this way.

CMP Is that right? Okay.

ACDR God damn! ...

CMP Okay, ...

ACDR Okay, well I'm going up ...

ACDR ...

21 15 34 CMP What time is it, by the way?

ACDR 1:24.

CMP Okay, we're on schedule.

ACDR 1:25.

CMP When I get the ...., Tom, ...

ACDR ...

CMP Thank you.

21 16 00 CMP Yeah, we ought to be there; we're in pretty good shape.

ACDR ...

CMP Okay, I'm going to open the hatch here, PRESSURE EQUALIZATION valve.

ACDR ... go do it.

CMP Hey, here's another washer.

CMP Yeah.

DMP ... down pretty close to ...?

21 17 18 CMP I'll tell you what, Deke, the stuff right now is mainly that ... and if you can catch up ... access ... I'll ...

ACDR Will you give me a Flight - Flight Plan?

CMP Trouble is where ... washer.

ACDR Let me have it, I'll put it up. Right here.

ACDR Man, I've got a ...

CMP Hey, I've got to ...

ACDR ...

CMP Oh, yeah.

ACDR ...

CMP ... (Laughter)

ACDR ...

CMP Oh, that's ...

ACDR Let me have ...

21 19 04 CMP I'll tell you. You know, I don't know much, but I'd say ...

ACDR ...



CMP Yeah. ... a little lower ...  
 ACDR Yeah. ...  
 21 19 44 CMP Okay. Hey, Tom?  
 ACDR Yeah?  
 CMP I've got a stable pressure down here so we're going  
 to move right ahead and open up the hatch.  
 ACDR Sounds good.  
 CMP You've got the drift check ..., right?  
 ACDR Right here.  
 DMP Would you hand me a Flight Plan ...  
 DMP You know what? ...  
 CMP Yeah.  
 21 20 58 DMP God damn! ...  
 CMP ...  
 DMP ...  
 DMP ...  
 DMP Do you want to hold that - that hatch, please? ...  
 DMP Tom?  
 DMP Let's see, ...  
 DMP Can I help you on the checklist?  
 DMP Can I help you on the checklist?  
 DMP All right. ...  
 DMP Hold that ...  
 DMP Okay.

DMP ...

21 27 27 ACDR Roger. Got a good hard dock - middle lined up, and all the latches are good.

21 27 49 ACDR Okay. Well, we're kind of busy now, we'll pick it up. Couple of quickies in here.

DMP Okay.

DMP Okay, what have you got?

21 29 11 DMP Okay, prepare for CM/DM ... on panel 6. ... POWER; OFF. VHF AM, OFF; FM, OFF; SUIT POWER, OFF; AUDIO CONTROL, NORMAL. Okay, on 274. Okay. ... 274. Yeah. Circuit breaker DOCKING SYSTEM A, six, OPEN.

CMP Six, A, OPEN. Verified.

DMP ... and the other one is ... CM/DM POWER, two of them.

CMP Yeah, all 12 should be OPEN.

DMP SYSTEM A, SYSTEM B. Circuit breaker DOCKING ... You got it? Well, next is connect DM umbilical, page S/2-3. Thank you.

21 31 38 CC-H Apollo, Houston. Newfoundland for 6 minutes.

ACDR Roger. Read you loud and clear.

ACDR We're on page 4-5 in the Launch Checklist. Vance is connecting the DM umbilicals.

CC-H Roger. Tom, how do you read me?

ACDR Loud and clear.

CC-H Okay. Be advised, we're going to be sending one of our nominal commands here to the booster to enable the extraction maneuver to occur per the nominal Flight Plan.

ACDR Vance, where are you? Is that the ... Deke and I had ... down below us and out in front of ...

CC-H Apollo, Houston. Tom, you're fading in and out, and I'm only getting about half the - your conversation.

ACDR All right, ...

CC-H Okay.

ACDR Yeah. All right. Well, you're ... on it right now. We're in the middle of this checklist. Deke says the power's off. His comm power is off, and, also, looks like Vance's headset went out. We'll call you on that later.

21 33 21 CC-H Okay, Tom, copy. And, Tom, that - that transmission I heard loud and clear.

ACDR Okay.

21 34 10 DMP Okay. Connect \*\*\* I'm back here, post umbilical connection configuration. Panel 6: POWER, AUDIO; VHF AM only, T/R, ...

DMP Okay, then 274: Circuit breaker DM POWER MAIN A, CLOSED.

CMP Okay. MAIN A's going CLOSED.

CC-H Apollo, Houston. We still have about 3 minutes here at Newfoundland. If somebody has time to read me the P52 data in the Launch Checklist, that's fine. Otherwise, we can pick it up at Madrid.

DMP Hey, Dick?

CC-H Yeah, go ahead, Deke.

DMP ...

CC-H Okay, Deke, copy. Thank you very much.

21 35 17 CMP And, Dick, CP here. We found out why I lost comm. When I took the tunnel hatch number 1 out, why we dragged it through the tunnel and it turned off my headset switch here on panel 98.

CC-H Okay, Vance. Read you loud and clear now. One more thing. We've got a - we've lost a couple of TM parameters. If somebody's up around panel 2 or 3 - if you could read us two quads - 2 points, we'd appreciate it.

DMP Go ahead, Dick.

CC-H Okay, we need O<sub>2</sub> TANK 1 QUANTITY.

ACDR ... TANK O<sub>2</sub> QUANTITY ...

CC-H Okay, we're reading off the scale low. Also, we don't think we have a problem there, but it's TM. Also, we need QUAD Alfa HELIUM TANK TEMPERATURE.

ACDR QUAD Alfa ...

21 36 22 CC-H Okay, and the same thing applies to that one.

CC-H Apollo, Houston. We're 1 minute to LOS. I'll give you a call at Madrid in an hour and 51 minutes.

ACDR ...

CMP ... quad Alfa ...

CMP Okay, ...

CMP You got ... Okay, ...

21 37 20 CMP Camera's ...

CMP ... 14040.

CMP ..., I guess, I can ...

CMP Yeah, I'll ...

ACDR Okay. ... the hatch. Put it back ...

CMP ...

ACDR Well, ...

CMP ...

21 39 20 CMP Yeah, ...

21 40 32 DMP I'll tell you, we've got these quantities.

CMP Okay. We're doing fine.

21 43 59 CMP (Laughter) Roger.

DMP I got the ...

CMP That's better.

DMP Well, let's see.

21 49 48 DMP We don't have anything for a little while.

CMP I'm going to go look at stars ...

CMP Boy, ... lightning. I guess it's ...

CMP Okay. ...

ACDR Okay, I'll watch it, too.

ACDR 016 ...

21 52 50 ACDR ... roll is 00 - 001.6, pitch is 017.2, yaw is 359.0.  
... Starting the S-IVB ... attitude.

CMP Yeah, we're really not in that ...

ACDR ... 2 hours ...

ACDR Delta-V ...

22 00 00 ACDR You have a ... light on.

DMP Yeah, ...

CMP Okay, ... why don't I go ahead and call? Okay,  
VERB -

22 04 25 CMP Yeah.

CMP Yeah, that helped.

DMP We're upside down.

22 15 15 DMP Okay, why don't we shine a little light up there ...

22 15 32 DMP Okay, TAPE RECORDER: HIGH BIT RATE, FORWARD, COMMAND,  
REWIND.

22 15 52 ACDR ... at 12:56.

DMP ... I can see these ... light come out when the horizon.

22 16 16 ACDR Sunrise.

ACDR Sunrise at about 24.

DMP Tom, ... look out this window. God damn, I can't ...

ACDR Oh.

DMP ... help with this ...

ACDR All right.

CMP ...

DMP You can look straight across ... Okay, I'll turn this down.

ACDR What, at the aurora?

DMP Yes.

ACDR I don't know what else it could be.

DMP ...

ACDR Yes.

DMP Yeah. I'll be damned. ...

CMP Yeah.

22 17 28 ACDR I've seen a ... horizon time like that. Not near that bright though.

CMP ...

ACDR Oh yeah. I can look out through the hatch window.

CMP Why. When you're coming through aurora ... a little light.

CMP Loud and clear, Dick. And we're setting up here for ... All ready to go.

22 18 00 CC-H Okay. Again the comm ...

CMP Understand. Okay. And we -

ACDR ... see what's our roll angle.

CMP Yes, I went up and take [sic] a look ... tunnel.  
That's perfect alinement.

ACDR ...

22 19 13 CMP Yes, look at that. Man, is that pretty!

DMP We took some pictures of the ...

CMP Yeah.

DMP Now you got the ...

ACDR Yeah. Got it right here. ...

CMP Look at the speckles going away.

CMP Okay, we're up to 1515, SERVO POWER 1, AC 1.

DMP All right. Go.

CMP And I hope I don't get your ...

22 19 57 DMP The Government should give you an honor. It looks  
good ...

22 20 11 DMP Man, get this ... up. We've ought to have ...

DMP It's really tough getting down there and back.

22 20 26 CMP Okay, we're coming up on 58. ...

22 20 38 CMP That's the time to be - ARM the PYROs.

22 20 53 DMP Okay, ... PYROs.

TIME SKIP

22 56 17 ACDR 1 second ... .. probably be here - going to be about 18 seconds.

DMP ...?

ACDR Okay. I'll put it in a bag for you.

ACDR Think I'll leave my biomed on tonight. ...

ACDR ... Aw, we've got about ...

CMP ...

22 57 35 ACDR Okay. Coming up to ... We're going to get ATS at about 18. Check on ATS. You going to get your checklist?

CMP Yeah.

ACDR Okay. Acquire ATS high gain: MANUAL, WIDE, minus 78, and yaw 34. ...

CMP Pitch is minus 78?

ACDR Yaw, 34.

CMP When do we power it up?

22 58 12 ACDR We're going to acquire ATS at ... We've got ATS coming up.

CMP ... 19.

DMP Well, the high-gain pitch rate is on page ... ..

ACDR Can I help you on that, Vance?

ACDR ... we've got a bubble ...

ACDR You leave the - get the bags ..., Vance? ... keep the back circuits ...

ACDR Hey, Vance. Check the bags for the ... your helmet?

CMP ...

ACDR Yeah. Great ... it out for me.



DMP Yes. That's a noisy son of a bitch.

ACDR Yeah, is sure is. Okay. ...

DMP Man, that God damn ... is a noisy son of a bitch, isn't it?

ACDR ...

DMP I can hold some of that for you, Vance.

ACDR ...

23 02 50 CC-H Apollo, Houston. Newfoundland for 6 minutes.

ACDR ...

CC-H And, Apollo, be advised we do not have an update for the backup GDC aline pad and the star acquisition pad today. And also, if you - I've got some different high-gain angles if you have maneuvered to the preliminary pad attitude for ACM.

ACDR Okay.

DMP Go ahead, Dick.

CC-H Okay. These are good for the - the attitude for the preliminary pad: pitch, minus 78; yaw, 147.

ACDR Did you get those.

DMP Yeah. ...

23 03 35 ACDR Pitch, minus 78; yaw, 147.

CC-H Roger. Naturally, I'm talking to you on - on VHF at Newfoundland, and we'll - I'll talk to you on S-band when we get locked up.

ACDR Okay. And I'll maneuver to that new attitude.

CC-H Okay.

ACDR Are we locked on?

DMP For your information, Dick, when we powered up to  
 that ATS, we got a horrendous background noise, and  
 it seemed to stay there.

ACDR ... ATS ...

CC-H Roger, Deke.

DMP ...

23 05 16 DMP Houston, how do you read through ATS?

CC-H Loud and clear, Deke. How me?

DMP Cleared up; no noise. It's amazing.

CC-H How about that?

DMP We're getting an echo from you and - but we surely  
 got rid of all that background noise since you came  
 on the air.

CC-H Incidentally, Deke, I remember from one of the tests  
 that we did down at the Cape when Crip was down  
 there, that he had the same - same thing. When lock-  
 ing up, he had a tremendous loud noise, but as soon  
 as we got a good lock, it went away.

DMP ...

23 05 53 CC-H Okay.

23 06 06 ACDR Go ahead ...

TIME SKIP

23 51 12 ACDR Go ahead.

ACDR Roger. ...

ACDR Roger.

CMP Hope it wasn't too bad.

ACDR (Laughter)

ACDR That ... going to be of any difficulty.

ACDR Trying to get ... for a ...

CMP Huh?

ACDR Did the S-band ...?

CMP Yeah.

ACDR ... we're okay.

23 52 33 ACDR Well, we could turn that down if we have to.

CMP Yeah, it could be bad if - Do we have a ..., Tom?  
... got it.

CMP Deke, you got a minute?

CMP You mind plugging that in down there ...

CMP Well, it should be strapped to the side walls or the -  
kind of directly in front of you or I can snap ...  
Yeah. That's a good safe place for it ...

CMP Yeah, it could be. But there is a procedure, and I  
ought to remind everybody what it is. It calls for  
cleaning out the urine receptacle. You'll - yeah.  
It's all right. Urine dump ... Verify. Should be  
experts on that. Yeah. Okay. Connect plumbing.

CMP ...

23 55 13 CMP ... It should go. That's ...

ACDR ...

CMP Say what? Yes.  
 ACDR Vance, ...  
 CMP Yeah.  
 ACDR ...  
 CMP Sure.  
 ACDR ...  
 CMP Okay. ... Yeah.  
 23 56 23 ACDR I had a hard time ...  
 CMP Yeah, ...  
 CMP ...  
 ACDR ...  
 CMP Okay. Yeah, go ahead. ...  
 CMP ... taken off. ...  
 CMP ... me a hard time. ... connect it back. Okay?  
 ACDR Okay.  
 CMP I'll get this ... out of the way.  
 CMP Okay. Ready to go, Tom. Now, ... in the LEB. Okay.  
 What's your ...?  
 CMP Oh.  
 23 59 49 CMP Yeah. Over Orroral Valley.

# # #

DAY 197

00 02 13    CMP        I'll set up the ...  
              ACDR        ...  
              CMP        ...  
              ACDR        I ... EMP ...  
              CMP        ...  
              ACDR        ...  
              CMP        ...  
              CMP        ... turned it off yet?

00 11 44    ACDR        No. ...  
              CMP        Okay.  
              CMP        ...  
              ACDR        Hello, Houston, Apollo ...

00 13 26    CC-H        Apollo, Houston. How do you read?  
              ACDR        Roger. Loud and clear.  
              ACDR        Houston, Apollo.  
              CC-H        Apollo, Houston. I'm sorry; we dropped into a real  
                         short keyhole there. How do you read me now?  
              ACDR        Loud and clear, Dick.  
              CC-H        I read you with a little bit of background noise, but  
                         I can hear you okay, Tom, and I've got a preliminary  
                         NCl when you're ready to copy.  
              ACDR        Okay. Ready to copy.

00 14 31    CC-H        Okay. Starting with NOUN 33. 005:38:29.00; plus  
                         063.5, plus four balls, plus 022.0; 181, 053, 001;  
                         054.2; 00:03. The weight, 32818; trims, plus 0.71,  
                         minus 0.45. Go ahead.  
              ACDR        Roger. 005:38:29.00; plus 063.5, plus all balls, plus  
                         022.0; 181, 053, 001; 054.2; 00:03. Weight, 32818;  
                         plus 0.71, minus 0.45.

00 15 59 CC-H Roger, Tom. That's a good readback. Let me tell you just a word about the trajectory here. We have - we've got some tracking that shows a little bit of out-of-plane. However, the FIDO thinks that this plane change is so small, and he doesn't have a good handle on it. We decided we will not do a plane change maneuver tonight. There may be an out-of-plane component in the - in a phasing maneuver tomorrow, or we might have to do one at some point tomorrow. But, at any rate, there will be no change of plane maneuver tonight.

00 16 36 CC-H Okay. Also, Tom, we do not have any CMC data here. So we've decided not to uplink the state vector in the blind; you can go back to BLOCK.

00 16 46 ACDR Roger. BLOCK.

00 16 47 CC-H Okay. Two more things. We - we're ready for the VTR POWER switch, that's just one switch on panel 400, to go OFF. And we're wondering - -

ACDR You cut out, Houston.

00 17 07 CC-H Okay, Tom. We wanted the VTR POWER switch to OFF, and we - we're wondering how you were doing in getting the suits off.

ACDR Okay. Vance's is off, Deke is putting his in the bag, and mine is part way off.

00 17 18 CC-H Okay. I'll leave you alone.

CMP ...

00 17 24 ACDR Okay. VTR POWER switch is OFF.

DMP ... bag.

CMP I put mine in the ... bag. And I put it there temporarily because I needed the ... for exercise. We weren't using that for ... yet.

ACDR ...

00 18 20 ACDR ... upside down ...

CMP Okay.

CMP ... out of plane.  
 ACDR ...  
 CMP ...  
 ACDR Yeah.  
 00 21 42 CMP Throw it away?  
 ACDR Throw it away.  
 00 21 47 CMP ...  
 ACDR ... better let the air out of it ...  
 DMP ...  
 CMP Could be.  
 DMP ...  
 CMP ...  
 ACDR ...  
 00 25 56 ACDR Would you believe? ...  
 CMP ... supposed to be ...  
 CMP Should be ...  
 CMP It's already set up, Deke. Yeah. I got it while  
 you were in the ...  
 ACDR Okay.  
 CMP ...  
 DMP ...  
 CMP Okay.  
 00 31 02 CMP Would you like to go back and get it, Deke?  
 CMP Oh, ... I'll get it for you. Got one right here.  
 Here we go.

ACDR It's warm in here.

00 33 40 CMP Yeah.

CC-H \*\*\* How me?

00 35 00 CMP Loud and clear.

CC-H Roger. We're standing by, and we'll have you on ATS when the time comes and we get locked up. See you there. And also the - you're GO for the NCl with the preliminary pad. There's no final pad required.

CMP Understand. GO, NCl, with preliminary pad. We won't be getting a final.

CC-H That's right, Vance. Incidentally, after we get locked up on ATS and have good data, we'll get your target load and state vector in. We did not get it in, as you know, at Hawaii.

CMP Understand.

CMP Just the outside this time. Yes, I did both ... I don't know why that is.

00 36 39 CC-H Apollo, Houston. How do you read on ATS?

CMP Loud and clear.

CC-H Okay. If you'll give us ACCEPT, we'll get you a state vector and the target load.

00 36 50 CMP Okay; you've got ACCEPT and POO, and we're getting an echo from you.

00 36 55 CC-H Okay. I'm reading you loud and clear, Vance.

# TIME SKIP

01 22 50 CMP TVC SERVO POWER ... 1/A, 2/B. RCH [sic] POWER, NORMAL, two; AC, DIRECT, OFF; BMAGs at 1/2. SPACE-CRAFT CONTROL, SCS. ... your GIMBAL MOTORS.

ACDR ...



CMP Okay, clockwise, no MTVC. GIMBAL MOTORS, PITCH 2, YAW 2, START.

DMP ...

01 23 49 CMP And your trim is plus 7.7 and minus 20.5. You're having - CMC, and then check MTVC.

DMP ...

CMP Okay, AC/DC and MAIN A, MAIN B ... RATE 2. Ready for test?

01 24 43 CMP RATE, HIGH.

DMP All right.

CMP RHC and THC, ARMED.

DMP Both.

CMP Okay. Let's check your EMS. At 67.2, that will be 54 point something.

01 25 04 CMP Okay, Deke, SPS....

DMP Huh?

CMP Standing by. ... second burn.

01 25 26 CMP 54.2 was right. ... They hit it right on the head.

DMP ...

01 25 39 CMP Yeah, those must be pretty big swells.

ACDR ...

CMP ...

ACDR ...

CMP Yeah, isn't that nice? ... Okay, how does everything look for NC1? Going to burn BANK B. ...

CMP Do you see the power change? ... change ...

ACDR Yeah.

01 26 36 CMP Yeah, look at that. That's over the land ...  
DMP ...

01 26 53 CMP You aren't ...  
DMP ...  
CMP Sure go ... ..  
CMP Houston, Apollo.

01 27 15 CC-H Apollo, Houston. We read you clear but weak.  
CMP Okay, everything's going good. We're set up for  
NCl in about a little over a minute. ...  
CC-H Roger. Understand you're standing by for the burn,  
and just a reminder for BANK B.  
CMP Roger. Understand. ... is NORMAL.  
ACDR EMS, NORMAL.  
CMP THC POWER, ON.

01 27 45 ACDR POWER, ON.  
CMP Okay. ...  
CMP ... BANK B, ON.

01 28 08 ACDR B, ON.  
CMP Okay, ... ullage; ready -

01 28 14 CMP MARK.  
ACDR ... ullage.  
CMP I'll give a countdown. 8, 7, 6, 5, 4, 3, 2, 1, 0.

01 28 38 DMP ... OFF ... Okay, ... 1 coming OFF ...  
CMP There's your trim.  
DMP ...

CMP ...  
 DMP Okay.  
 01 28 57 CMP That's quite a jolt, isn't it?  
 DMP Yeah.  
 CMP Okay, ... remaining on residuals.  
 DMP ...  
 01 29 11 CMP ... Okay, it's minus 0.1, plus 0.1, minus 0.1 ...  
 ... 14.1.  
 ACDR Okay. Got it.  
 01 29 41 CMP Got the ROLL, the GIMBAL MOTORS, the SERVO POWER?  
 ACDR Got it.  
 CMP AC BUS TIES, OFF. ... Got to get the - -  
 ACDR ...  
 CMP Yeah. And at 59 plus - -  
 ACDR ...  
 CMP Okay.  
 ACDR ...  
 CMP Yeah. Pitch rolled over. The attitude we've got,  
 Tom. The attitude.  
 ACDR ...  
 CMP Is that it?  
 ACDR ...  
 DMP ...  
 ACDR ... Man, that is something!  
 CMP Yeah. Look there. Wow! I never thought the ...  
 would even look like that. ...

ACDR Well, that's why ...

01 30 57 CMP Yeah.

ACDR ...

CMP (Laughing) Yeah.

ACDR ... You've got to put this light out, here.

CMP Oh, yeah. ... far away. I'll put this light out and make it cool in here. We don't need the heat.

ACDR ...

01 31 18 CMP I never have either. That's the trouble. I think I'd want to take a picture of every place in the whole world.

CMP Okay. ... Don't have much to do for a while. ... Okay! Yeah. Let's see, "If NPC not required, maneuver to SI plux-X forward attitude."

01 31 58 CMP VERB 49 ENTER; VERB 25 ENTER. Okay. Plus 12.00 ENTER; plus 14.00 ENTER.

ACDR 140?

CMP No. 14.0 ...

01 32 17 ACDR Well, okay. ... 14.00 ENTER.

01 32 24 CMP Right. Okay. Now, VERB 43 ENTER - -

ACDR Hold it. Look at the book.

CMP Yeah. First, let me find it. Plus 12 degrees, plus 14 degrees, plus 332.

ACDR Plus 332. Okay. ...

01 32 49 CMP PRO.

ACDR Did we do it?

CMP Yeah. ...

ACDR ...

(b)

CMP ...

ACDR ...

01 33 15 CMP Okay. We've got a height measurement of the AC and DP "if time permits" and me in any case, I guess; in Experiments Checklist on page 1-59.

ACDR ...

CMP Tom, look outside. Look how bright the lights are.

ACDR What island - -?

CMP ...

ACDR What island is that? Is that the Galapagos?

01 33 47 CMP We're heading for Hawaii, Tom. ... You have to kind of learn how to - It's upside down. Yeah. We'll get that ... Okay. As soon as we get this stuff done, it's ... That's right. Well, ...

DMP Oh, man, this stuff's ...

ACDR ...

CMP Okay. It's a beautiful world.

01 35 46 DMP Okay. I guess you want me to strip, or something like that.

ACDR ... ?

CMP ... Yeah. About to break me.

ACDR ...

CMP Yeah.

ACDR ... A-6.

CMP Which one do you want to do first, Deke? Your leg or your sitting?

DMP I'm going to do the ...

CMP ... with some spirit.

DMP ...

DMP ...

01 38 26 ACDR Vance, will you ...

CMP ...

ACDR ...

CMP I think I know where it is.

ACDR Okay. ... Help me get that junk straight ...

01 39 44 CMP Okay. I'm ready for Freddy.

ACDR Okay. ...

CMP No. Do you want me to take ...?

ACDR ... Okay. ... How about putting ...

CMP No.

ACDR I've forgotten how to ...

CMP ...

ACDR ...

CMP ...

ACDR You've got to ...

CMP ...

ACDR Okay. ... Okay.

01 44 17 ACDR Height, 130. ...

CMP Tell you what I'll do, Deke. ... and then I'll -  
You getting the left leg or the right one?

01 45 23 CC-H Apollo, Houston through Hawaii for 2 minutes. How  
do you read? Still have a couple of items. Is  
there someone free to copy?

ACDR Yeah. Go ahead, Bo.

CC-H LM ascent data; look on page 1-6 of the Rendezvous Book - that's 1-7 of the Rendezvous Book: 27818.

ACDR ...

CC-H We're going to do a purge burn, and that's going to be done at about 6:30. \*\*\* More information when we get into ATS coverage.

ACDR Roger. Purge burn at 6:30.

CC-H Your LM ascent data on page 1-7 which is about the center \*\*\* 27818.

CMP Get him to ... Get a ...

CC-H \*\*\*ger. That's 27818.

ACDR Okay; 27818.

01 46 48 CC-H Roger. And on panel 377, we'd like you to put the GLYCOL TO RADIATORS SECONDARY to the NORMAL position.

CMP Get it yet?

ACDR No.

CC-H \*\*\* to cool you off some. \*\*\* back with that problem when we have next communications pass.

DMP Okay. You're intermittent, Bo.

CC-H \*\*\* that again. We're doing that to cool you off, and we'll have more information when we have another comm pass.

DMP Okay. Now, what's the position he wanted? ...

01 47 48 CC-H That was GLYCOL TO RADIATORS SECONDARY to NORMAL.

CC-H And, Apollo, Houston. We'll see you again at Bermuda at 6:15.

CC-H It's the water quantity transducer we understand is bad.

DMP Well, it's oscillating and ...

CC-H \*\*\* 60 to 80 percent, right?

DMP Yeah, ...

ACDR Okay. ...

CMP ...

ACDR (Laughter) Oh, yeah. ...

CMP Okay.

01 54 22 ACDR Okay. While we're at it, why don't you take ...

ACDR ...

ACDR We're right on normal ...

ACDR Yeah. ...

ACDR Okay. ...

CMP Okay.

ACDR No, we're not. We're over the ...

ACDR Yeah, we'll ...

CMP ...

ACDR ... high gain ... pitch ... yaw.

01 58 10 ACDR High gain: pitch, minus 54; yaw, ...

CMP Pitch, minus 54 ...

CMP Well, I guess I'll give it a try.

ACDR In that case, ...

CMP ...

ACDR ... Okay. ...

ACDR ... down around ...

DMP ...



ACDR ... the other ...

CMP Deke, you didn't see any other ...

CMP Here they are. ...

CMP ... band of air sort of thing ...

02 01 27 ACDR Hey, Deke, you guys feel warm?

DMP No. Not anymore.

CMP Okay. I've got the ...

DMP Something like that.

DMP ... Okay. I'll get it out of the way.

ACDR Yeah. ... won't have to ...

DMP ... O<sub>2</sub> ...

ACDR ... Maybe ...

DMP Okay.

ACDR That's coming out of here like ... back by the hatch ...

02 06 28 CC-H Apollo, Houston through Bermuda. How do you read?  
Roger. Would you please go ACCEPT so we can give  
you the rendezvous REFSMMAT.

TIME SKIP

03 22 10 CMP ... we have a ...

ACDR Houston, Apollo. Well, Bo, we have a problem. ...

03 22 56 CMP Okay, Bo, everything's ... checklist ...

TIME SKIP

04 40 22 CC-H Apollo, Houston through Guam for 2 minutes.  
CMP Okay, fine.  
CMP Tom - -  
04 41 08 CC-H Apollo, Houston through Guam for just a little over  
a minute.  
04 41 15 CMP Roger.

TIME SKIP

05 08 10 CMP ... down here, ... the only ... is ...  
CMP Okay. That's right.  
DMP Yeah. ...  
CMP No, it's better than the ...  
DMP ...  
CMP ...  
CMP ...  
05 09 22 CC-H Apollo, Houston through MILA for 3-1/2 minutes.  
CMP Roger, Bo. ...  
05 12 37 CC-H And there's about 30 seconds until LOS.  
CC-H And we're going to say good night now unless you  
need to talk to us again at Quito where we get into  
ATS coverage.  
CMP Okay. See you in the morning - or somebody.  
05 12 54 CC-H (Good night.)  
CMP ...  
CMP Yeah, ...  
ACDR ...

05 13 58 CMP Yeah.  
 ACDR ...  
 CMP On the ... you know ...  
 05 18 31 CMP ... problem ... cabin pressure ... oxygen ...  
 05 18 59 ACDR Hello, Houston; Apollo.  
 CMP ... So anyhow, I - I ... Now if I had a ... It's  
 not going to lock up by itself ...  
 ACDR ... problem. ...  
 05 22 56 CMP Well, I ... catalog ...  
 05 23 32 ACDR Hello, Houston; Apollo.  
 05 23 37 ACDR All right, Bo. We got a problem. We can't get the  
 probe out to stick that wonderful little freezer up  
 there.

# TIME SKIP

15 29 01 CMP Okay, Deke.  
 DMP What? ...  
 ACDR ...  
 15 29 26 CMP Yeah. ... see where it says 27:09, there?  
 CMP So I help Deke with activation. We're supposed to  
 turn on the UV lamp pretty soon.  
 ACDR ...  
 DMP Well, we're only about 20 minutes behind, I think.  
 ACDR ... We've got to get out of A-6 ... handheld DAC.  
 CMP Okay. A-6 ... Okay. All right.  
 CMP Say that again, Deke.

CMP Okay.

CMP I'll get in - I'll get your book here in a minute and help you.

ACDR Oh, shit! To get the fish out of A-6 I got to get the hatch out.

CMP You can just slide it over - under A-5. We've just got to shuttle it around where we don't need it, I suppose.

15 32 00 CMP Okay, Deke. Do you want me to read the procedures to you for - to speed up or - -?

DMP ...

CMP Huh?

DMP ...

CMP Okay. Yeah.

CMP Hey, on this zone forming fungi, are we supposed to leave the covers open?

CMP Okay.

ACDR ... flashlight ... battery went dead. Will somebody get me a ... I don't have time to ...

CMP Okay. I think they're - oh, we can find out later. Here's one.

ACDR Where you at, Vance?

CMP Right over the ...

ACDR ... flashlights.

CMP Okay. I think we'd better ask them about the covers.

15 32 53 CMP Houston, Apollo.

CMP Okay. A question about the zone forming fungi. Of course, when we take pictures, the covers are open. The rest of the time, should the covers be closed or open? Just in between pictures?

CMP Right.

ACDR We need to get some climbing(?) cables out ...

CMP Okay. That's what we thought. Thank you.

ACDR We activate the - -

CMP ... the MOCR. Oh, we didn't, huh. Okay.

DMP ...

CMP Okay. Yeah, we got to go back and do a wholesale recheck, I guess.

ACDR Okay. Deke, you have the foaming demonstration and the wicking back there, don't you?

DMP Yeah.

ACDR Can we eventually transfer those looking ahead?

CMP Did you get that, Deke?

15 34 09 CMP Okay.

ACDR The wicking and the foaming ... transfer them to the docking module? Over.

CMP He wonders if the wicking and foaming get transferred up to the docking module.

DMP ...

CMP Eventually. Not now, Tom.

ACDR Okay. There's supposed to be some fish in here someplace.

15 34 43 CMP Okay. Now.

CC-H ...

CMP Roger. Understand.

CC-H ...

DMP Okay. We'll check it; see if you can get a better focus.

ACDR Hey, Vance?

CMP Yeah.

ACDR ... the camera setup. Here. I'll just give you the whole thing ...

CMP Okay. Just a second. Let me - let me ...

15 36 37 CMP Okay. Now I'm ready, Tom.

ACDR Okay. Hey, I'm going to ...

CMP Okay. Well - -

ACDR ... get other stuff out.

CMP Okay, but let me give this bag back to you.

ACDR You got ... in there, too.

CMP Do you need it?

ACDR No.

CMP Do you need that for ...

ACDR ... bag ...

CMP Do you need that for your - experiment? Yeah. I guess you probably do need ... Okay. I'll put your bag up here someplace.

15 37 28 CMP I'll put it in F-2.

ACDR ... looking for the ...

CMP Oh, I'm sorry. Yeah - no, you're out of the way.

CMP Now, has anybody seen the Nikon camera it's not in its poke?

ACDR The Nikon is down here in the TSB.

CMP Yeah, ... Okay.

ACDR Here you are, Vance.

CMP Okay. Thank you.

15 39 00 CMP Deke, do you remember if that bracket's in the bottom or the top of U-1? That bracket to the Nikon - you know if - that extender - you know if it's in the top or the bottom of U-1? Okay.

15 39 47 ACDR We'll never get all that stuff ... around ... - We'll never get this ... fixed up.

CMP Well, that's why we're going to have to put some of it over in A-5. That's something that we told them we'd do on the ground, I guess.

CMP Well I'll be damned if I can find that extender.

15 40 53 DMP Well, I sure don't see the extender in U-1. Let me try F-1. Not in U-1; let me try F-1, here. Huh? Not in - Okay.

CMP My God, if it had been a snake, it would have bit me, But I sure couldn't find it. Okay, thank you. Look at these ... Look at these ... (Laughter)

CMP Gene, thank you.

15 42 58 CMP And, Deke, you know where the Experiment Checklist - could that be looked for?

ACDR I've got it down here. I'm looking at the fish.

CMP Okay.

DMP I just got the fish out. I'm going to put that back - ... the fish box - Right now I don't know what in the world's going on.

15 43 18 CMP Oh, maybe you can stuff it down to the side there or something, or put it in the TSB.

15 44 03 ACDR Yeah. Yeah. I don't know ... You mean bungee, one of these. Oh, I'll be damned. Wouldn't you know it. ...

15 45 33 CMP Hey, Tom. Going to have to get to that ... get some stuff later, I guess ... Let's see.

ACDR Yeah.

15 46 23    CMP    Oh, wonder ...

             DMP    Yeah.

             ACDR    Okay.

15 46 44    CC-H    Apollo, Houston. Short pass at Orroral Valley for about 3 minutes. How do you read?

             CMP    Loud and clear, Crip [sic].

             CC-H    Roger, Vance. How y'all doing?

             CMP    I estimate we're about 20 minutes behind the time line. Deke is getting ready to go into the DM.

             CC-H    Okay. Super.

             CMP    We've just opened hatch 2.

             CC-H    Okay. Thank you.

             CMP    I guess I don't see the ZFF on here. Wonder what the ZFF ... on the sleep - for the postsleep orbit.

15 47 40    ACDR    Let's look in the Flight Plan. ...

             CMP    No. I'll look in the postsleep to see if it's there.

             ACDR    Okay, ... two of them. There's another one in the ... Yeah. Where? Over here?

15 48 49    CC-H    Apollo, Houston. We're about 1 minute from LOS. We're going to have a short Santiago pass at 27:53; then we'll see you on the satellite. The high-gain angles in the checklist are good.

             CMP    Okay. Very good, Dick.

             CMP    Did any - did anybody give the old crew status report?

             ACDR    Yes. Deke did it.

             DMP    Yeah, ...

             ACDR    ... just barely looked at it.



15 49 58 CMP Okay. That goes down in ... You got to leave it off all the time ... there's a little container in A-5.

15 50 06 ACDR A-5. ... in my pocket.

CMP Okay, Deke. Need any help?

DMP Yeah.

15 50 13 CMP Okay. I'd like to read out the checklist, and I'll check that everything's ... on the wall.

CMP Yeah. Is - is all the checklist done? Okay. We'll - we'll -

15 50 54 CMP And if you want, I'll read your checklist to you.

DMP ...

CMP It's up to you.

DMP ...

CMP Okay. And, Tom?

ACDR Yeah.

CMP Who said that we would do ZFF? I couldn't find it any place. Did - did one of you guys read it?

ACDR This morning?

CMP Yeah.

ACDR That's back in the Flight Plan. We had one last night.

CMP I know one every 12 hours, but I just didn't - Well, I looked through the Flight Plan.

ACDR It'd be right after wake up.

CMP Yeah.

15 51 50 CMP Okay. It's mine. What is it? (Sneeze, sneeze) Okay 8 - it's what? 8B is DM cabin pressure and it's over 1.3. 8A is 1.6.

15 52 43 CMP Okay. That's circuit breaker, all checked. Okay, DM POWER MAIN B or A, CLOSED? CLOSED now? Well A is CLOSED. Now I'm going to CLOSE B. Yeah. It's verified CLOSED. And ... where do you want B?

15 53 15 CMP Well, it's not. DM POWER. Okay, I'm closing it. Now you got both of them CLOSED. ...

ACDR ...

15 53 54 ACDR Do you smell something funny in here?

CMP Yeah, it's - just glue [?].

ACDR Glue?

CMP Yeah.

15 54 26 ACDR Vance, here's your flashlight back.

CMP Thanks.

15 55 07 CMP All right. Say what it is, Deke.

CMP Okay. I'll hand you the chart if you'll hand me the book. I'll do it and bring the book back. Okay?

15 57 52 CMP Hey, it's cool up there. Okay, do you want me to start reading, Deke? Maybe you can ...

15 58 13 CMP Yeah. Don't think I'd worry about it too much. Okay. CB's LIGHTING 1-DM A and 2-DM B, CLOSE. You're supposed to have done that. LIGHTING 1 and 2 start and then on.

ACDR Hey, Vance?

CMP Yeah, Tom.

ACDR What's that ... smell up there? ...

CMP No.

ACDR God damn. Something's smelling like mad. Come down here for a minute. ... Hey, come here. That regulator's smelling like a son of a bitch. Come here.

CMP All right. Yeah.

ACDR What's your cabin pressure? Hang on. You hear that?

CMP Yes.

15 59 03 ACDR See what the cabin pressure is. 425.

CMP Wow.

ACDR Clamp this valve shut.

ACDR What was that our ... on the pressure? ... Hey, Deke. Deke. Hey, Deke! We're down to 425 in the cabin. We're down to 425 in the cabin. We got a God damn leak! What - what does that read up there? What's the cabin pressure up there? Okay. You guys ... I kept hearing it.

15 59 54 ACDR Get all those valves - all those valves locked - closed up there. Lock them closed.

CMP Where?

ACDR Has Slayton still got that vent ...?

CMP Oh, shit! Get it?

ACDR Okay. Man, I was wondering what the fuck, until I kept hearing this, and I figured you guys were making all the racket. And then suddenly ... so I checked you.

CMP Okay. Wow.

ACDR You got that squared away. Okay.

CMP Okay. Is it - EMERGENCY REG stopped - stopped pulling, huh?

16 00 42 ACDR Yeah, we're - we're at 4-1/2. Think we ought to ground contact and give them shit.

CMP Yeah.

ACDR (Laughter)

CMP Okay. You want me to start reading to you, Deke?

ACDR ...

CMP All right. You got the trans - Okay, you got the transfer down there, Tom?

ACDR The what?

CMP The transfer checklist like Deke's got. Have you got another one down there?

ACDR It's right in there.

16 01 20 ACDR ... Okay. Well, I'm still ... the fucking fish eggs, which is - -

CMP Okay.

ACDR ... which is probably the ...

CMP I'll go get the UVA cable.

ACDR Do you know where that is? ... The thing is, I can't leave the fucking fish eggs ... low priority.

CMP Okay. Yeah, you really ought to have it, Deke.

ACDR Yeah, go ahead ... to get the ... What did he have, the vent on for the DM?

CMP Yeah, ISOLATION. We'll have to hurry[?].

ACDR You're darn right. ... I thought you guys were ... made me feel like my ears were popping and I'll just go down and check the ... check the pressure.

CMP Okay. What page you on, Deke?

CMP Okay. I'll find it. I got it.

16 02 31 DMP I'm on comm now, finally.

CMP Okay.

DMP Okay. We're on page 1-3.

CMP Okay. How's the cabin ...

DMP That's what's wrong with that God damn checklist with you on comm here. I'm going to - Well, we're more than half. That's pretty good.

DMP Yeah, it'll build up when the regular ...

DMP It'll build up as soon as we get things going in here. Okay -

DMP AUDIO 1, ON. Okay, got all the UV stuff down in the CSM there.

CMP Okay. Let's see, the UVA cable's in that bag.

ACDR ... bag on top of A-1.

CMP Yeah.

DMP Yeah. I'll keep going up here.

ACDR ... this fish egg thing ...

CMP Okay.

ACDR ... a little while.

CMP Where do you have to do it?

16 03 24 ACDR Right on the LEB below the ...

CMP Well, I'll try and get out of our way here.

DMP Okay. I'll try that speaker box here. ... speaker box.

CMP Good.

ACDR Loud and clear.

16 03 58 DMP Okay, O<sub>2</sub> REGULATORS ... A coming ON ...

CMP Tom.

ACDR Yeah.

CMP Here's the camera for the ZFF, too. I guess that ought to be done sometime. It's in the checklist.

ACDR Hang on.

DMP I guess it was ... but I didn't check the light.

ACDR I don't see it ... Yeah, ZFF photos. ... DP back at 25:30.

CMP Okay. I guess that - you can stick that up on the ...

16 05 02 ACDR Yeah. I'll do that. Is there a bracket underneath that son of a bitch?

CMP ... yeah. And it's on the camera, and the camera's right on ...

ACDR The bracket is on the camera?

CMP Yes. I put it on when I ... - -

ACDR Joint Ops Checklist. Where's the Joint Ops Checklist?

CMP Well - or the Experiments Checklist. You've got that. Have you got the Experiments Checklist?

ACDR Yeah, but I can't get to it. It's down ...

ACDR Ah - it isn't in here ...

16 06 01 CMP It should be at the end there someplace.

ACDR Experiments?

CMP It think it's there - -

ACDR Joint Ops.

CMP Here let me ...

ACDR Here it is.

CMP Should be real simple.

ACDR ...

CMP ... UVA cable.

DMP Okay?

CMP I've got it.

16 06 33 CMP And let's see, which end do you get?

DMP Okay. ... cable and connect J2 ... cable ... Got it connected down there?

CMP Here's P1 and P2.

DMP Okay.

CMP Okay that's - Here's a red dot here. Red dot to red dot.

DMP Red dot - This is a yellow dot here.

CMP Well, here's a yellow dot.

DMP Yeah; one end goes to 800 - -

CMP ...

DMP Better make sure.

CMP Here's the ... end.

DMP The DM.

CMP Yeah. That's one thing we can ...

DMP That end's supposed to get hooked on to 230 down there.

16 07 29 CMP Okay. Is it supposed to be done yet?

DMP Yeah, ... it's supposed to be done before you bring it up here, but that's all right ...

CMP Okay.

DMP Take one on each one.

CMP Whatever the procedure says.

DMP ...

CMP Okay.  
 CMP Get it?  
 16 07 55 DMP Yeah.  
 CMP Good. Halfway.  
 DMP That's right.  
 DMP Secure UV cable using designated straps on tunnel wall. I don't know why they did all that. Just wondering whether it's good comm going in here ...  
 ACDR The cable ...  
 CMP Good.  
 16 08 32 CMP ... time to get the ZFF ...  
 DMP Okay.  
 CMP There's another cable there.  
 ACDR Okay.  
 CMP Another snap.  
 ACDR Okay. I've got to start checking things off. ...  
 ACDR Okay. I've got this ZFF ...  
 CMP Okay.  
 16 09 06 CMP And do you want to get the tape[?] too?  
 ACDR It's going to take me a couple of minutes. I - I've got - I've got the camera set up, but I need the lights and all that.  
 16 09 14 CMP Well, I'll let you go ahead.  
 ACDR Deke ...  
 CMP Well, if I can get by you right now, while you're getting ready to do it.



ACDR Yeah, you can get by me ... some space over there ...

DMP There's some ... down in there, Vance. Let me check on it when you're down there.

CMP Before I connect it up?

DMP No. Go ahead. Got to make certain the POWER is OFF ... on panel 230.

CMP Which POWER is that?

DMP UV ABSORPTION.

CMP Okay.

16 09 55 CMP It's OFF.

CMP Okay. It is connected to panel 230?

CMP Okay. Stand by.

DMP ...

16 10 13 CMP Yeah. Yeah, this is going to be the - the fun one.

CMP (Cough)

16 10 36 CMP Okay. ... Here we go.

DMP Got her? ...

CMP Not yet.

DMP ...

16 10 50 CMP Got it!

DMP Okay.

CMP I didn't think I could - would be able to do that.

DMP ... turn the UV - UV power ...

CMP ... Well, whatever he says.

DMP ... Okay. On 274 -

CMP Yeah.  
 DMP Circuit breaker UV/DOPPLER MAIN A, CLOSE.  
 CMP Stand by.  
 16 11 13 CMP UV/DOPPLER MAIN A, CLOSED.  
 DMP Okay. That's panel 230?  
 CMP Yeah.  
 DMP UV COVER, CLOSE - verify.  
 16 11 21 CMP Okay. It's barber pole. It sure looks that way.  
 Yeah, verify.  
 DMP Okay. UV ABSORPTION POWER, ON.  
 16 11 29 CMP POWER, ON.  
 DMP ABSORPTION LAMPS, ON.  
 16 11 32 CMP LAMPS, ON.  
 16 11 33 ACDR 27:51:25 ... on the Flight Plan. ... log ...  
 DMP What was that again, Tom?  
 ACDR 27:51:25.  
 CMP 51:25. Okay.  
 ACDR ... the Rendezvous Book? Okay.  
 DMP Hey, while you're down there, Vance, how about us  
 making sure we got everything on the checklist before  
 he checks it off.  
 16 11 52 CMP I checked it off. You can check everything at the  
 first ... We're configuring it.  
 DMP Okay. Good enough.  
 DMP Okay. ... right down through here.  
 CMP Okay. I'll get out of your way now, Tom.

DMP : Check those? Checked all those. Okay. Through with page 1-3. Okay. If you're - you're available, Vance, got an - a last minute checklist here, you know.

16 12 30 CMP Okay.

DMP If you're ... I'll just do it.

CMP Okay. And - if I find it here.

DMP Okay. You can start at the top here of page 1-4.

16 12 39 CMP Okay.

CMP 1-4: HIGH PRESSURE RELIEF, AUTO; verify, two.

16 12 45 DMP AUTO verified.

CMP Verify lock engage. Press - LOW PRESSURE RELIEF, CLOSE, verify.

16 12 53 DMP CLOSE.

CMP And could you turn the volume down a little on that box?

DMP Yeah. Okay.

CMP Okay. O<sub>2</sub> PURGE PRESSURE RELIEF, CLOSE.

16 13 06 DMP CLOSED.

CMP PRESSURE RELIEF VALVE REFERENCE to DM, verify.

16 13 11 DMP Verify.

CMP CB's INSTRUMENTATION DM A, DM B, CLOSE, verify.

DMP \*\*\* 51:25 ... Is that right?

CMP 27:51:25.

DMP 27:51:25.

CMP 27:51:25.

CC-H ...

ACDR 27:51:25. Okay. I'll be ... in a minute.

CMP Okay. CB - You got so - Soyuz POWER DM B, OPEN?

16 15 05 DMP That's OPEN.

CMP CB DM A/DM B TIE, OPEN, verify.

16 15 09 DMP DM A/DM B TIE, OPEN.

CMP CB DOPPLER TRANSMITTER DM A, OPEN; verify.

16 15 16 DMP DOPPLER TRANSMITTER, OPEN.

CMP Okay. And D-1, unstow the HHAG and mount in the high pressure relief valve recess.

16 15 24 DMP D-1 ... HHAG ... Where are you HHAG?

CMP I think it's up front on the right. I think I can see it under that bag. You have to take the ... bag out.

DMP ...

CMP Yeah.

DMP Yeah.

DMP There she is.

CMP Okay. Mount in the recess in the high pressure relief area.

16 16 01 DMP Right.

CMP Okay. Unstow TSB D-1 and mount on DM wall to right of fire extinguisher.

DMP Okay.

16 16 24 DMP To the right of the fire extinguisher. Right here.

CMP Yeah.

DMP ... work down on the ground.

CMP Yeah, sure is. Unstow bungees - two of them - from D-1 and snap to the D-4 locker.

16 16 43 DMP ... Okay.

16 16 55 ACDR Okeydoke, ... The POTABLE water INLET is now closed.

DMP Does it say how many of them?

CMP Two.

CMP Here, I - I can do that.

DMP ...

CMP ... Okay. There you go.

DMP Got another one on there.

CMP Right.

DMP ... Looks like ...

CMP Yeah, I do to.

16 17 32 CMP Sure nice to have this DM open, I'll tell you.

DMP Oh, yeah. It's got a lot of room, doesn't it?

CMP That's what's been our problem up until now.

DMP Yeah.

CMP Okay. Unstow the Flight Data File container from D-2 and snap into position on panel 845.

DMP Okay. Flight Data File - coming out. And we'll snap it up right there with the little snaps.

CMP Right.

DMP That way.

CMP Get that?

DMP Yeah.

CMP Okay. Remove TV light shield from Flight Da - Data File container and install on furnace control box Velcro.

DMP Okay. This damn snap isn't ...

CMP Put her on the Velcro.

DMP ... right here. Okay.

16 18 50 CMP Okay. Record the DM systems gages as follows: N<sub>2</sub> 1 and 2 tank quantity.

DMP Okay.

CMP 1 and 2 in order.

DMP N<sub>2</sub> - 1 is 82. Number 2 is 82. O<sub>2</sub> - -

CMP Okay.

ACDR - - is 84 and 82.

DMP Our cabin press?

DMP Press is 230 about.

CMP Okay. That's below a little bit yet, but it's not too far. Cabin temp?

DMP Temp is 170. What - that doesn't sound right.

16 19 28 CMP Should be 17, probably.

16 19 32 DMP 17. Oh, that's Centigrade. Yeah, it's 17. Okay. (Laughter)

CMP Okay. And PPO<sub>2</sub> A and B.

DMP Okay. We got on A - it's about 175, and B is 170.

CMP Okay PPCO<sub>2</sub>.

DMP About 0.0 - 0.7, rather.

CMP 0.7, huh?

DMP 0.7.

CMP Okay. Next is DAC setup. Note: Stow miscellaneous straps, lens covers, bags, et cetera in TSB on DM wall.

DMP Yeah, right.

CMP Okay. Obtain from D-3 and assemble the following: DAC 02.

DMP Okay. D-3

CMP D-3.

DMP Right here.

CMP Uh huh.

16 20 18 DMP DAC number 02.

CMP And - you got a filter on the DAC, right?

DMP Yeah.

DMP I ... I can't believe that ...

CMP Okay. DAC 02. That's right. Mag CI02 on - -

DMP ...

CMP Okay. 5-millimeter lens; should be on it.

DMP On it.

CMP U-mount.

DMP Okay. U-mount's next. ... down in here.

CMP Here it is. Camera - that's the bracket that's supposed to come out.

16 21 06 CMP Well, I thought that - they usually ... - -

DMP No, nope. They don't. That's that - -

CMP That's the special one. Okay.

16 21 16 DMP Okay. Boy, we're going to need all those ...

CMP Okay. Yeah. No, Deke, by U-mounts - they mean - they mean the ... position it to 105.

DMP No, they don't either.

CMP Yes, they do.

DMP Nope. This is the U-mount.

CMP All right. But - position DAC U-mount: 105, 220, 235. They - -

16 21 40 ACDR Read you loud and clear, Dick.

CMP They ... DAC with bad terminology, but that's what they mean.

16 21 44 ACDR Okay; one thing that's a problem here is the fact - -

#### TIME SKIP

17 22 16 CMP Okay, is the WASTE STOWAGE VENT valve CLOSED?

ACDR Probably not.

CMP Okay. It says we're supposed to close that.

17 22 29 ACDR WASTE - WASTE STOWAGE VENT? Oh, yeah, that's been CLOSED. ...

CMP Okay.

ACDR Myrtle's come open ... Myrtle's ...

ACDR Okay.

CMP Okay.

ACDR Okay, I've got everything that you have outlined there.



CMP We missed the cal. Okay.

ACDR Oh, yeah.

DMP Hey, what - God damn it! I don't know which experiment we're supposed to be putting in here right now. Do you guys?

CMP It tells in this procedure, I think. I think it's 41. Check under the furnace - -

ACDR The furnace ops.

CMP - - ops.

ACDR Yeah. The furnace ops. ...

17 23 50 CMP Okay, on panel 181, CM 1 STATION POWER, OFF.

ACDR ... CM 1 ... Oh, it is OFF.

17 24 06 CMP Okay. TV AMPLIFIER, BYPASS.

ACDR ...

CMP No, it's the one over on the right.

ACDR ...

17 24 15 CMP TV AMPLIFIER, BYPASS.

17 24 18 ACDR BYPASS. Okay.

17 24 23 CMP Oh, hell; now it says you can go WASTE STOWAGE VENT valve, VENT. We just came to that because we didn't do the cal. Okay. WASTE STOWAGE VENT valve back to VENT. Sorry. Okay. ... Is that it? Now it's all a matter of getting ready for this vibration test. Have we come to that already?

ACDR Oh, yeah. That was ... That was about an hour and a half ago ... systems activation.

CMP Oh, yeah ... Okay. Well, I'll try to get that ...

17 25 15 ACDR It's 12:30, Houston time.

ACDR Okay, Vance, what's the next ... ?

CMP Okay.

ACDR ...

CMP Yeah, if I was you, I'd go ahead and -

ACDR ...

CMP Hey, Deke?

DMP Yeah?

17 26 45 CMP Just one thing. When you set up your Nikon, does that go in the same bracket as the cassette - as the ... TV did? Or does it go - - ?

DMP No, it goes on the DAC bracket.

CMP Okay. But you have to move the TV out of the way? You probably do.

DMP Yeah. Well, there's another ... here.

ACDR ... stowed, because if I move it around and ...

CMP Yeah, it was supposed to be eaten yesterday. Some of it, anyway.

17 27 32 DMP Son of a bitch! Those God damn furnace guys made this thing so you can't close it. Okay, ... 104 - 204. God damn, Reed, I'm going to kick your ass. It's not hooked up right. ... six ... full, but I've only got two in here. ...

ACDR Oh, this is bad trouble. Vance, would you pass the stuff from the TSB over here. I've got ...

CMP Well, I probably, last night, had to move them around.

ACDR ... B in 104; ... B in 204.

CMP Damn shit! Now I've lost the ...

ACDR Son of a bitch! Everything's coming out of the ... Oh, fuck!

DMP When do we get contact with ... again?

CMP Oh, stand by.

CMP Quite awhile; coverage ... in 20 minutes.

DMP Well, I can't get the door closed on it. ... Darn it.

ACDR Well, all I've got is ...

CMP What?

ACDR ... 10<sup>4</sup> and 20<sup>4</sup> in ... are all jumbled up.

17 30 10 CMP Well, this apparently has got stuff jumbled up ... Well, in holding this stuff, Tom, now I can't do anything. Let's see where I can put this. I was just about to get that thing set up ...

ACDR We don't see any data here. ... Now, here - here ...

CMP Okay, I guess you have to put ...

ACDR Yeah, we'll ...

CMP I'm not going to get ..., anyway.

ACDR Yeah.

CMP I don't have time to even start on it.

17 32 09 CMP Why - why don't you pull out the trays, Tom, and I'll try to put some of these ... in there - a couple of them.

CMP ... it on.

DMP Okay. One thing I noticed here, Vance. Maybe you got it down there.

CMP What's that?

DMP ... In this checklist, it says to the CP, "Remove TV and U-mount from bracket 605. Remove wide-angle lens and stow in F-2. Obtain zoom lens in F-2, install," and all that good stuff. ... supposed to do that? ... in this checklist, for some reason.

CMP Okay. Under what section is it?

DMP It's on page 1-6. Head of the page is multipurpose furnace prep.

CMP Yeah.

17 34 03 DMP You guys unstowed the cartridge and passed it to me, and I've done all that stuff. Then the next step is the CP: "Remove TV and U-mount from bracket 605."

CMP Okay. Well, I can do that, Deke, but I was trying to get your camera set up for the docking - -

DMP Okay. Fine. Yeah, I was just trying to figure out what we hadn't done here, you know.

CMP Yeah, I don't think we've done that.

DMP ... One I didn't know about.

CMP Yeah.

ACDR What page is it?

DMP 1-6 of the Docking Checklist.

17 34 33 DMP Vibration test is completed.

DMP Okay, Tom, I'm putting mag - magazines here, too. Then get the stuff from F-2, probably. Obtain DAC six-pack ... Okay. DAC six-pack. ...

CMP Deke?

DMP Yeah?

17 35 28 CMP On your 300-millimeter lens - Nikon setup, that's supposed to attach right in the DAC spot right on your window, huh?

DMP Yeah, right.

CMP Why the long arm, I wonder? Oh, I see. You've got to put it right back on your eye.

ACDR Okay, it says, "Obtain DAC mag. Remove mag C102 from DAC 02 in bracket 857."

CMP Right.

ACDR "And retrieve mag C103 from bag and replace with 102." Which bag? They didn't say what bag. ... got to be this ... Go ahead ... used all that one up?

DMP I don't know. I probably did.

17 36 17 DMP Okay, "Remove bag ... Retrieve mag 103 from the bag and replace with 102." That label ... there - it was in there, huh?

ACDR Yes.

DMP ... can't tell. ... expect ... go over there and help do that, huh? F-1 ... Okay, we got a green light. That one's all right.

ACDR Hey, Bob put in here "used and replaced" ... - -

CMP Okay.

ACDR ... activation. ..., too.

CMP Bang! Bang!

ACDR ...

CMP Yeah.

DMP Okay, and that can go in F-2.

ACDR Is that where we put the six-pack, ...?

17 37 34 DMP No, we've been putting them in F-2. That's what we decided.

CMP This special light, Deke, that you have to ... Where do you generally find it?

DMP Oh, it would be in that - in that ... bag. ...

CMP Yeah.

17 38 06    ACDR    Okay, "Obtain remaining US DAC mag." ... The color chart's next. ... pass bags - five - up to F-2?

             DMP    ... I think we put everything in F-2, Tom.

             ACDR    Okay, ... I've got - I've got the first one.

             DMP    Except the six-pack is the ... one.

             ACDR    I've got the six-pack. Then it says, "Obtain remaining US DAC mag bags - three of them - in D-3. ... Color TV charts ... five mag bags and the TV color chart ... CM. Stow the mag bags and ... color chart in R-3.

             DMP    Okay.

17 39 16    CMP    How about ATS, Tom? Are we coming up on ... very soon?

             ACDR    ... Flight Plan ...

             ACDR    ... Yuk!

             CMP    ...

17 40 08    ACDR    Okay, you got ... six-pack ...?

             DMP    Right.

             ACDR    ...

             DMP    ... Okay, one other one.

             ACDR    That's what it says, but I don't know what in hell they're talking about ...

             DMP    Maybe three - D-3.

             ACDR    Yeah. ... should doublecheck. ... Oh, here we are. ... Okay, then I pass you the color chart. Yeah, ...

             CMP    What's this ... or ... 29, over there?

             ACDR    That's ...

CMP Okay, do you have a bag up here?

17 41 23 DMP Okay, the color chart's goes in R-3, and everything else is in F-2. Okay, and I got to remove all the straps, covers, and et cetera and put them in D-3. Stow the portable light in TSB. ... all that stuff.

DMP I tell you one place that's cold enough, Tom.

ACDR What's that? Up there?

DMP You're damn right. We got all kinds of condensation in this ... vehicle.

ACDR ...

DMP Yeah.

ACDR Of course, it's cooled down here in the docking module ...

CMP Yeah.

DMP Hey, Vance, that checklist was right. There was another package. ...

CMP What page - How far are you from finishing that up up there now, Deke?

17 42 25 DMP Pretty close, Vance. I've got to take all these bags and stow them in the - D-3.

CMP Okay. Maybe I can - now that I've got your camera set up, I can help you.

DMP Oh, okay.

CMP But if you - ... 00, why, I won't come up.

DMP No, sir. When we do that, you're going to tell Houston, "Mark 00" sooner or later.

17 42 49 ACDR I think you have this Hasselblad for this yaw maneuver.

CMP We don't want it here, Tom, because we want to use it out the window.

ACDR      Okay. Well, use it ... right window ...

CMP      Well, I'd put it back in ...

17 43 23    CMP      Okay. This is full. Get one of the bags - one of  
the bags here. ... ..

DMP      In D-3.

CMP      Okay. Have you got the suits ready? ... entered  
in ...

DMP      I haven't ...

CMP      ...

17 44 11    DMP      ... (laughing) ...

CMP      Well, if they don't get us caught up.

DMP      I don't mind getting ... Okay. "Remove straps" -  
We stowed this portable light in the TSB. Pre-  
docking ...

CMP      Okay, maybe if I could put this under the ...

DMP      ...

CMP      It will.

DMP      Yeah.

17 44 47    ACDR      We're going to miss this ... Man, it's ... ..

CMP      Oh, that's a ...

ACDR      No kidding. ...

CMP      Hey are you serious?

ACDR      Okay. This thing comes up at - we haven't got the  
docking system checked out; we haven't got the  
instruments cal.

CMP      We've got to find out what Houston would rather do,  
I guess.



DMP ... the tapes we can do later; ... equipment filing tapes. We could hold out ... tape measure, Tom.

ACDR Yeah, sure.

17 45 26 DMP And I think probably we could determine bias and get the star cal in Earth light. Don't you think?

ACDR Yeah, sure.

CMP I've got this camera set up, so we - -

DMP ...

CMP - - whenever you get that over with.

DMP Let's see, that's 6 degrees in ... at - yaw ... I'm about at the end of this thing, Vance.

CMP Okay. That just about covers everything.

DMP Yeah.

17 46 04 CMP I'm going to get one. Is the right ... in front of me?

DMP Yeah. You're there.

CMP ...

ACDR Have you got the ... and the tape recorder set up, Deke?

17 46 21 DMP Yeah. I passed those on. We've only got one problem. The God damned shroud cover was locked in ... No good son of a bitch! I don't know what that's going to ...

17 46 45 DMP I guess when ..., it's just my time.

TIME SKIP

19 34 11 CC-H Apollo, Houston. We're about to go S - LOS from MILA. Once you get locked up on the ATS right here, we'll pick you back up.

19 34 22 CMP ...

ACDR ...

19 37 20 ACDR ... what you had here. You got a map - we have mapping pass. Yeah. I - I - I had it out here, you know. ... I have the Earth Ops book.

ACDR ... the Hasselblad ... that's the TV.

19 39 35 (Whistling)

ACDR Okay. All right. ... 3, 4, and 5.

ACDR Yep, yep ... I got ... What you need is the cameras out and ...

19 42 23 CC-H Apollo, Houston through Madrid.

ACDR Loud and clear.

CC-H Hey, Tom. Have you been trying to lock up the ATS?

ACDR Roger.

CC-H Okay. Let us read these angles again here. We want to get you locked up and switch over to ATS so we can get you a good pad in a little bit. Hang on.

19 43 01 ACDR ... your angles.

CC-H Apollo, Houston. Say again.

ACDR Roger. What do you have for your angles there?

CC-H We're rechecking them right now. Hang on just a second, please.

19 43 25 CC-H Tom, Houston. The - the correct angles are pitch of minus 7, yaw of 313. Why don't you try those real quick, and - and let's see if we can get locked up on ATS.

ACDR Pitch, minus 7 and yaw, 313.  
19 44 01 ACDR Okay, we've got ... should have ATS now.  
19 44 05 CC-H Okay. I'm reading you low and clear. That's real good. And, stand by 1 on the pad. Hang on.  
19 44 51 CC-H Apollo, Houston. I've got a preliminary PCM pad for you when you're ready to copy.

TIME SKIP

20 30 51 CMP Okay, right down at the bottom. ... 21.4, 1; 24.3, 2; 29.1, 3; 35.1, 4; 35.1, 5, too; 33.8, 6.  
20 32 13 CMP 7 is ...

TIME SKIP

21 08 46 CMP There it was.  
21 09 04 ACDR ... All right. Yep ...

TIME SKIP

21 59 57 DMP Man, those snow-covered peaks ... clouds.  
ACDR ... looks like ...  
22 00 46 DMP I hear that water's rougher than hell when there's ice in it. There's all kinds of white ...  
ACDR Yeah.  
DMP ...  
ACDR That's caused by the ...  
CMP You got what?  
ACDR ... under the clouds. Bunch of ...?

22 02 07 DMP ... if you can see the surf down there, Tom.  
ACDR Yeah.  
DMP ...  
ACDR ... way out here. Not there, not there. ...  
ACDR ...  
22 03 09 ACDR I saw a kind of a ...  
ACDR All right. Okay. I'll - That's okay. You guys  
finish it and I'll take care of it.  
22 03 34 DMP Earth obs, rev ...  
\*23 02 47 ACDR Oh, yeah.  
\*23 04 37 ACDR Yeah.  
\*23 06 54 DMP Yeah. ...  
USA (Sneeze)  
\*23 14 57 CC-H Let's see if we can get locked up on ATS.

# # #

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\*Time of dubious validity.

DAY 198

01 03 57 ACDR ... Yes. ...  
01 05 31 ACDR One thing I want to do ...  
01 07 21 ACDR Yes, ...  
DMP ...  
01 08 23 ACDR Yes. ...  
01 09 27 ACDR Let me have that.  
01 10 33 ACDR ...

TIME SKIP

01 36 03 CMP ...  
01 36 17 CMP Huh? Yeah. I thought I did very well.  
CMP ... even helped ...  
01 37 22 CMP Deke, make sure it's ...  
CMP Yeah. ...  
DMP How big was ...?  
CMP 85. But I haven't ...  
CMP Yeah. Here's the ...  
01 37 48 CMP Yeah. I ... that one has more ...  
CMP Yeah. We got ... Well, we'll do that.  
01 38 27 CMP Either one of us have ...?  
CMP Yeah. Never ...  
CMP ...  
01 39 59 ACDR Just above ...

TIME SKIP

07 05 07 MCC-M (Roger. Repeat the last ones, please.)

07 06 26 USSR (6 ... 070 T1, yes and 155. Here also 11, 10, 40, 12, 40, 3, 16, 14, 04, 43, 15, 36, 55, 17, 09, 27, 15, 36, 50, 20, 08, 59, 21, 36, 50, 20, 08, 59, 21, 37, 50, 22, 52, 59, 00, 25, 22, 01, 57, 24, 03, 29, 49, 05, 03, 16, 06, 38, 12, 29, 47, 08, 09, 20, 54, 10, 53, 20, 12, 25, 48 - 12, 25, 58, 13, 47, 22, 20, 19, 30, 19, 52, 02, 18, 18, 19, 19, 46, 09, 21, 19, 02, 22, 37, 35, 00, 07, 45, 01, 39, 47, 03, 12, 1, 04, 45, 41, 06, 20, 43, 07, 29, 21, 09, 03, 08, 10, 35, 32.)

MCC-M (... by a ... of communication, yes?)

07 16 02 SCDR Apollo, Soyuz. How do you read me?

DMP (Good morning, Alexey, ...)

SCDR Deke, where's Tom?

DMP (Soyuz, Apollo. How do you read me?)

SCDR Read you loud and clear, Deke.

DMP (We also read you well. How are you?)

SCDR Hey, Deke.

DMP Yeah, this is Deke.

DMP (...)

SCDR Well - -

DMP ...

SCDR How you feeling today?

DMP (... , Alexey, ...)

07 17 07 SFE The tunnel 2 is 280 now. In orbital module, it's okay.

TIME SKIP

08 06 56 CMP Yeah, it looks like we might. I can hear a hissing.  
 08 07 02 CMP Houston, Apollo.  
 CMP Houston, Apollo on ATS.  
 CMP Pretty good, Crip. I've got a little something to report to you here.  
 08 07 32 CMP Well, at 43:20, approximately, we got a ...

TIME SKIP

11 30 24 ACDR Loud and clear. Go ahead.  
 CMP No. I can't get it.  
 ACDR You can't reach back there? Do you want to ... around to the mike? ...  
 CMP ...  
 ACDR ...?  
 CMP Yeah.  
 CMP ...  
 ACDR ...  
 CMP ... I haven't seen them either. ...  
 11 32 14 ACDR 47:22 ... Loud and clear.  
 ACDR We're maneuvering into that attitude now with a VERB 49. We don't have too far to go.  
 ACDR Houston, Apollo. How do you read?  
 CC-H ...  
 ACDR Go ahead, we read you loud and clear.  
 ACDR Hello, Houston; Apollo. How do you read?

11 32 55 ACDR ... Houston, Apollo. We read you loud and clear.  
How us?

11 33 03 ACDR Roger, Houston. We read you loud and clear. How us?

ACDR Houston, Apollo. How do you read?

ACDR ...

ACDR Hello, Houston. This is Apollo. We've been reading  
you loud and clear. Over.

ACDR Hello, Houston; Apollo. How do you read?

CMP Okay, are you guys ...

ACDR Do you have to take that off before you can ...?

CMP That's right.

ACDR You do, huh?

11 34 18 CMP Mainly because of the interference with the ...

ACDR Houston, Apollo. ... ATS.

CMP ...

ACDR I don't know.

CC-H ..., Houston. How do you read?

ACDR There they are.

ACDR Loud and clear.

CMP Okay. ... put that in?

ACDR Yeah.

CMP Okay. I can stick it in, if you want. Doesn't  
matter.

ACDR Deke, why don't you ... ahead while Vance goes ...  
pretty fast starting from now on.



CMP Yeah. Okay, tape recorder, shot 50 was of - 53 were  
 of the Cairo area. Stereo, three picture, and a  
 fourth one looking back, and finally - the last one  
 was the west coast.

CMP Okay.

CC-H ... TV picture ...

ACDR All right. Stand by.

CMP ...

ACDR ...

11 44 30 CMP That's what I need to do.

ACDR ... Polaroid ... get it on here.

CMP ...

CMP Oh, I see ...

ACDR ...

CMP Okay.

CMP Okay. We'll rotate it, Dick. And let us know.

CC-H Okay. ...

CMP Tell you what, I'll ...

11 45 30 ACDR Yeah. How's that look?

ACDR Hang on, Dick. We're trying to get hatch 1 back up  
 ... dicker with the TV camera.

CC-H Okay, Tom. ...

ACDR ... get that hatch up out of the way first. ...

ACDR Wrong way. The other way. It opens and closes ...

11 49 34 ACDR Deke, why don't you use Myrtle while you're down there,  
 and then I'll follow.

ACDR I got it covered.

CMP ... the Russians ...

ACDR I don't know, it could be.

11 50 55 ACDR Okay, Houston; Apollo. We've got hatch 1 closed, locked, and the PRESSURE EQUALIZATION VALVE, CLOSED.

CC-H Okay, Tom. Thanks for letting us know. ...

ACDR ...

ACDR What?

ACDR Okay. I'll ...

ACDR Houston, are we over Russia now?

CC-H ...

11 52 21 ACDR Okay. They've got a forest fire on top of a mountain that you can sure see at this point.

CMP See some - a contrail, too. See that contrail?

ACDR Yeah.

CMP It looks like pretty rugged country, this part of the world right here - a lot of mountainous country.

ACDR Well, Dick, ... watch the TV out the window then?

CC-H ...

ACDR Rog. You got a pretty picture on it out the window?

CC-H ...

ACDR All righty.

CMP You see that big circular - cloud up there?

ACDR ...

CMP Yeah.

ACDR Okay, I'll ...

CC-H ...

11 54 02 CMP On the average, how's it look now? And, we're giving you all the light we can ...

CC-H ...

CMP Hey, you want to use Myrtle?

ACDR Yeah.

CC-H ...

ACDR Okay.

11 55 31 DMP Okay, BMAG 1 ... WARM UP, and ... LINE HEATERS. We've got it on, huh?

DMP Hey, you know how long it's been on ...?

CMP Yeah, since we got up.

DMP The LINE HEATER?

11 55 55 CMP Oh, I thought you meant the BMAG 1.

DMP No. The -

CMP Light ...?

DMP ...

CMP No. It didn't either ...

11 56 18 CMP Okay. What is it, 47:56?

DMP Yep.

CMP Okay. Let's go to P32. ...

DMP ...

CMP Okay. ... Okay. ... Okay.

11 57 33 CMP Man, look at all the stars.

DMP Yeah. Little one ... Orion ...

CMP We have a lot of sparklers outside the spacecraft from an effluent dump. We ... Looks like a snowstorm out there. ...

DMP ...

CMP Isn't that amazing?

CMP Tom, you urine's really turned into a snowstorm out there.

CMP Okay.

DMP Okay. We'll get to it.

11 59 29 CMP ... supposed to shortly do?

DMP Wastewater dump.

CMP That's right. ...

12 00 10 CMP ... see the water down there. ... island.

DMP ... big one over there.

12 00 30 CMP Yeah, I'll bet you it's ... See the lights down there? ...

DMP Ah - ... VENT, Tom, I think ... OFF.

CMP We leave it VENT for a few minutes, then we can turn it off. And leave vent on on Myrtle, too. If you leave Myrtle on. Yeah. Myrtle on vent and the dump on for a while.

12 01 02 ACDR Okay.

CMP Okay. Here's the ... NOUN 84 is 33.5.

12 03 32 CMP Verify delta-V is 7.

CMP ... we're going to load 11002.

CMP ...  
 CMP Seems to me like we might as well do it now.  
 12 04 47 ACDR ...  
 CMP Maybe we can get a ... from the COAS.  
 ACDR Okay.  
 ACDR ...  
 CMP ...  
 CMP ...  
 ACDR ... but I'm looking.  
 12 06 51 CMP Yeah. It'll look ...  
 ACDR ...  
 12 06 58 CMP Oh, okay.  
 ACDR They want it in RECORD, huh?  
 CMP Yeah.  
 ACDR Okay, and all balls.  
 CMP Boy, that thing ...  
 ACDR ...  
 CMP ... 47 ... 47, 47, 2.  
 12 08 11 CMP ... back to AUTO.  
 ACDR AUTO.  
 12 08 23 CMP Back to POO.  
 ACDR Okay. Next thing coming up is ...  
 CMP Yeah. Why not try right now.

ACDR Okay. Let's ... VERB 49, all ...

CMP Yeah. All of them.

12 09 26 ACDR ... CMC, AUTO.

ACDR ...?

CMP Okay. Either way.

12 10 09 CMP Okay. And I'm ... off on the first ...

ACDR ... No, ...

12 10 48 CMP Oh, Tom?

ACDR Yeah.

CMP You put any water through Myrtle?

ACDR Oh, no I didn't.

CMP We ought to.

12 13 13 ACDR Here they are.

CMP Oh ho! Okay.

ACDR ...

CMP Okay; let's see ... 36. Really good, huh?

ACDR ... Okay.

12 13 48 CMP Okay. And we're ready for you to go MIN IMPULSE, ..., and I'll stand by for the burn.

ACDR Okay. ... CMC in FREE ...

ACDR Stand by. Stand by.

12 14 20 ACDR MARK. Right on.

CMP ... Okay ... I guess that's another ...

ACDR Okay. ...

CMP Okay.

12 15 05 ACDR MARK it.

CMP Easier than the simulator?

ACDR ...

ACDR Stand by.

12 15 37 ACDR MARK it.

CMP How about one more?

ACDR Stand by.

12 16 09 ACDR MARK it.

12 16 27 CMP Okay. You got it.

ACDR (Laughter)

CMP And POO; CMC, AUTO.

ACDR ... CMC, AUTO ...

12 17 54 CMP Okay. Starting the maneuver. Oh. ... do that maneuver at 48:10. We're not going to get them on the - are we doing this early?

ACDR No. ...

CMP We won't get them on ATS, they're on - Let's see, let me look. The thing we have trouble with is the noise level.

ACDR ... When we pick up ATS.

12 18 23 CMP Okay. We could pick it up later. Okay. I guess it does no harm.

12 18 31 CMP Okay. Let's do some other maneuvering.

ACDR How's those angles?

CMP They look good. Very good. Okay. You got ...  
65 ...

ACDR Yeah.

CMP Okay. I'm getting the Velcro.

ACDR ... God damn. We're looking for this stuff.

MS (Laughter)

12 19 20 CMP No, you guys ...

12 19 31 CMP ...

12 19 56 CMP ...

# TIME SKIP

13 31 56 ACDR Houston, Apollo. How do you read?

CMP No contact ...

USSR 4 minutes.

ACDR Okay. We're getting up to 3 minutes to the burn.  
Read me back through your S-band.

CC-H Okay. I copied.

CMP No contact.

USSR 4 minutes.

13 32 05 ACDR Okay. Well, I'm getting up to 3 minutes to the burn  
here. Why don't ... through your S-band?

ACDR I've got everything on VHF.

13 32 17 ACDR All right.

DMP I'm hearing them talking, I think ...



ACDR I've got them both ...

13 32 28 CMP Okay, Deke, ... Check the ... P34 ... 13, 21, ... 0.

ACDR Yeah, ... got a little bit ...

ACDR ...

CMP Can't get everything down though, probably.

13 33 28 ACDR Yeah. ...

CMP ...

ACDR ...

13 34 14 CMP Okay. NORMAL. You got it.

ACDR ... ullage.

CMP Yeah. 7, 6, 5, 4, 3, 2, 1 -

13 35 10 CMP BURN.

13 35 12 ACDR Okay, here we go.

CMP Sure enough.

13 48 33 SCDR Okay. Okay; 100 miles.

SCDR Tom, how do you read me?

13 49 02 ACDR (We read, Alexey. How me?)

SCDR I read you loud and clear. I am very glad we have good comm with Apollo. We have a saying, "it's better to see once than to hear twice."

ACDR (Good ...)

SCDR It's very good to hear you again, Apollo.

ACDR (... comrade.)

13 49 32 SCDR We are glad to check comm of the joint international space radio line. We are ready for talking.

ACDR (Roger.)

14 03 07 ACDR ... Deke ...  
ACDR Your calculations ...  
14 04 34 SCDR Okay. How should I say? I'm very glad to greet  
you, very glad for you. Okay. We said everything's  
okay onboard Soyuz.  
CMP (Regards ... hear me.)  
SCDR ... now.  
14 05 46 SCDR Okay. Roger. How are you feeling today?  
14 10 45 SCDR Apollo, Soyuz. Beacon off.

TIME SKIP

14 30 23 CMP Stand by. ...  
14 30 45 CMP Works out, G&N total delta-V was minus 13, and then  
... to 9.8. I'm sure it was 9 point something.  
ACDR ...  
CMP ...  
DMP ...  
14 32 25 ACDR Okay. Stand by. We're in the middle of the snack  
period now. We'll take a look. I don't want to ...  
too much light coming up for rendezvous ...  
ACDR Okay, side window ...  
CMP ... the CM.  
ACDR That was a ...  
DMP ...  
CMP ...  
DMP ...  
CMP What are we over right now.

ACDR ...., I'll tell you that.

DMP ... TV working down there, Dick?

14 36 16 CMP Marking is really ... Dick. The computer ... really know where we are.

14 36 53 CMP Well, I think we're over Africa.

14 43 23 DMP Look at that ...

CMP ...

DMP Yeah.

CMP ...

14 44 30 ACDR Okay, Dick. We must have got out of the area there where all the transmission - we could hear it both in French, English, and a little bit of Russian. Our tracker - our VHF is locked on good now. Okay, ... the docking attitude pad, is that going to be nominal ...

CMP ...

14 45 11 ACDR ...

14 45 26 SCDR Apollo, Soyuz. ...

# TIME SKIP

15 09 25 CMP Okay.

ACDR ... don't ... for me ...

DMP Yeah.

15 15 04 CMP Okay. TV switch list 1-19.

ACDR ... same ...

15 15 10 CMP Okay.

15 18 58	ACDR	(Soyuz, Apollo. How do you hear us?)
	SCDR	We read you ...
	ACDR	...
15 19 16	SCDR	Roger. We read you clear.
	ACDR	...
15 19 21	SCDR	Okay.
15 27 34	SCDR	Roger. 10 miles.
	ACDR	Are the ... on schedule? ...
15 27 54	SCDR	Roger.
15 31 01	ACDR	(Soyuz, Apollo ...)
15 31 07	SCDR	Roger. TK-1 completed.
15 31 33	ACDR	Alexey, Valeriy, (...)
15 31 43	SCDR	Orientation lights on.
	SCDR	Roger. ... miles.
15 37 21	SCDR	Apollo, Soyuz beacon is off. Soyuz beacon is off.
15 39 15	SCDR	...
15 40 33	SCDR	Roger ...
15 42 03	SCDR	Roger ... 2 miles.
15 45 06	SCDR	I have you 1 mile.
	SCDR	Roger. ... meters.
15 53 38	SCDR	Roger. 100 meters.
	SCDR	Roger. Apollo stationkeeping.
	SCDR	Go ahead.
15 54 19	SCDR	... 51444759.

CMP (...)

15 54 34 SCDR Roger.

15 55 00 ACDR Yeah. Okay ...

15 55 07 SCDR Apollo, Soyuz. Hatch number 5 is closed.

15 55 17 ACDR ...

15 56 48 CMP Okay. You're coming on ... You're - -

MS ...

CMP Okay. Deke, if you get a chance, could you tell me what the camera setting is supposed to be.

DMP Okay.

CMP Okay. On TV camera ... camera AVERAGE, SLAVE, and LINEAR ... Okay. Have you got that ...

DMP All set ...

CMP Okay. Did you get the ...? Got the camera. ... I got that. AVERAGE, SLAVE, LINEAR ...

DMP Okay - -

CMP ...

ACDR (That's a good ...)

SCDR Thank you, Tom. Thank you.

15 58 15 ACDR Did you ...

CMP Coming up ... 15 degrees of ... 38.

ACDR ...

CMP Okay. ... ATS pickup, minus 36 and ... 4.

ACDR ...

15 58 42 CMP Okay. We got it extended.

15 58 57 CMP Okay ...

ACDR ...

CMP Yep. Okay. You want me to ... up? You might as well ...

ACDR ...

CMP Okay. Yeah, I can't get ... this attitude right now ...

16 00 08 ACDR Houston, how do you read?

ACDR Loud and clear. How do you read?

ACDR Crip, you should have a good TV picture.

CMP Okay. TV has to be - -

DMP And we have the guide ring extended.

16 00 57 CMP Okay. Yeah, what we need is minus 2225 ... Maybe the thing to do is take the camera off for a second.

CMP Okay.

DMP Stand by.

16 01 37 CMP Okay. ... infinity.

16 03 31 CMP And, Dick, we have two lights, SM RCS B and D.

16 04 44 ACDR (Soyuz, please tell us when you begin your maneuver.)

ACDR (Soyuz, this is Apollo. How do you read?)

16 05 02 SFE I read you 5 by 5.

ACDR (Yes, please tell us when you begin your maneuvering.)

16 05 13 SFE We're initiating rotation maneuver. You see?

ACDR (Yes, very slowly.)

16 05 24 SFE Inertial orientation initiated.  
 ACDR (Roger.)  
 16 05 30 SCDR Soyuz docking system is ready.  
 16 06 47 SFE Tom, I see your spacecraft.  
 ACDR (Yes.)  
 ACDR (We see it. It's very beautiful. We see your periscope.)  
 16 07 08 SFE It's a good picture.  
 16 07 28 SFE Tom, roll maneuver is completed.  
 ACDR (Roger.)  
 SCDR Inertial orientation established.  
 ACDR (I'm approaching Soyuz.)  
 SFE Come in, Tom.  
 16 07 52 SFE Tom, please don't forget about your engine.  
 ACDR (Laughter) ... Yeah.  
 16 08 18 SCDR Inform us about range rate.  
 ACDR (Very good; 1/2 meter.)  
 ACDR (Less than 5 meters distance.)  
 SCDR 5 meters.  
 16 08 55 ACDR (3 meters.)  
 ACDR (1 meter.)  
 16 09 03 SCDR Roger.  
 16 14 53 SCDR (Moscow, Soyuz. Do you read me?)  
 CMP ... a Mayday.

DMP ... latest calling code.  
16 15 02 CMP Yeah.

TIME SKIP

19 09 51 ACDR Houston, Apollo. We've completed step 20, and they're working on step 21.  
ACDR Roger.  
ACDR Okay. ...  
CMP Yeah.  
ACDR You talking to me?  
ACDR You want to get your - -  
DMP I didn't hear your message there, Bo.  
DMP Okay. You're talking about that camera. Oh.  
ACDR Yeah.  
DMP Okay.  
19 11 10 DMP You didn't like the picture we had on the other one, huh? (Laughter) We can't fix that.  
19 11 27 ACDR Okay. And 37. He's at 40 right now.  
19 11 44 ACDR (Soyuz, this is Apollo. Now hatch 4 is open? Over. Roger. Roger.)  
ACDR Oh, okay.  
DMP Hey, that's beautiful. ...  
ACDR Okay. ... (...) ...  
ACDR I didn't hear you transmit.



DMP Yeah. ...

ACDR (Is it open?)

19 12 38 DMP Okay. We think they said hatch 4 is open, but we're standing by to confirm it.

CMP Roger, Bo. Let's give it a check.

19 12 52 DMP (Soyuz, this is Apollo. Hatch 4 is open?)

ACDR Something's shaking.

19 13 03 CMP Okay, Bo, the configuration looks good.

ACDR Oh, hell, that's the damn thrusters.

DMP (Soyuz, this is Apollo. Is your step 22 finished - completed? Over.)

DMP I think that's those guys shaking around there.

CMP Okay. The PHONE/MIC INTERCONNECT is ON. The F - VHF FM is on RECEIVE. And the setting's about 5.

19 13 48 ACDR How's that pressure?

DMP Well, it's staying right there. ... they're having trouble with their hatch.

ACDR (Soyuz, this is Apollo. How do you read me?)

ACDR (Roger.)

DMP Good show.

19 14 09 ACDR (We're now working on step 23, and we are equalizing the pressure between the Soyuz and the docking module.)

CMP Hey, Deke?

DMP Go ahead, Vance.

CMP Did you want panel 6 MODE to VOX to adjust sensitivity?

ACDR Okay. It's open, Deke. ... It's open.

19 14 29 DMP Yeah. Oh, boy, we might have missed a step here  
in - -

CMP We sure did.

DMP - - the comm configuration, Tom.

19 14 32 CMP Okay. You got it. How's that?

DMP ... we jumped ahead.

CMP Okay. Let me put it to VOX.

19 14 58 DMP Oh - somewhere.

ACDR Back, back, back, back.

CMP It's right around - "Prepare Apollo TV."

DMP I think on the time ... 41 minutes. I don't think  
we're to it yet.

CMP Okay.

CMP Let's see, the time is - -

DMP Yeah, it was here. Yeah. Right.

CMP Okay.

DMP Okay.

19 15 29 CMP About 52, I guess.

ACDR Okay, here we go. Now ask him to do it.

DMP Okay. But we got the valve open?

ACDR We got the valve open.

DMP Okay.

19 15 46 DMP - - panel 6, MODE to VOX.

CMP Okay, VOX -

DMP VOX sensitivity as required - approximately 7.

CMP Okay.

DMP On panel 98 - thumbwheel VOLUME down to eliminate squeal.

19 15 56 CMP Okay. You got it.

DMP Great. Okay, that did it.

19 16 00 ACDR (Soyuz, our step 23 is completed. We are now working on step 24.)

DMP Yeah. We're through with that, too, Tom.

DMP Right here - 25. Ready to open - Here, let me get the light on.

ACDR ...

DMP ... camera. Just a sec. Yeah. We're right on schedule. Okay, there.

ACDR Okay. Go to unlock.

19 16 28 DMP The camera is running.

DMP Okay. Right on schedule.

DMP Perform hatch opening.

DMP No. ...

ACDR (Soyuz, how do you read?)

DMP Are you hearing us?

ACDR (I am ready to open hatch 3.)

DMP You reading us, Bo?

19 17 05 DMP Okay. Well, we're not reading them much either.

ACDR We - we can read them - a little bit.

19 21 34 ACDR-OM Yeah.

ACDR-OM Yeah.

MS (Laughter)

19 22 06 ACDR-OM How do you read me?

USSR ...

SCDR-OM (Moscow, this is Soyuz. Read you very well.)

USSR ...

SCDR-OM ...

USSR Tom, ...

SCDR-OM Okay. ...

DMP-DM Tom, are you ready for the camera ...?

19 25 45 CMP-CM Are you reading Soyuz now?

ACDR-OM Hold onto that.

CMP-CM It's all down there. ...

CMP-CM Houston, how's your comm now?

CMP-CM And Soyuz?

19 26 57 SCDR-OM (Moscow, this is Soyuz. How do you read?)

SCDR-OM (I read you well. We are very grateful and excited by these warm words. And we will work even better.)

SCDR-OM (Thank you very much.)

CMP-CM Okay, Tom, I guess -

ACDR-OM (Roger.)

SCDR-OM (Everything is nominal, George. Have you turned off the other camera?)

SCDR-OM (Once more we would like to thank you for these warm words and would like to say, in answer, there is so much to say, and we have so little time.)

ACDR-OM (Yes.)

CMP-CM Bo, you reading us?

19 28 42 ACDR-OM Houston, Apollo, how do you read?

ACDR-OM Okay. Do you want Deke to give his headset now to Alexey?

19 30 40 ACDR-OM Okay. ...

ACDR-OM Okay. Let me see.

DMP-OM I think we can get it, Tom, so it won't ...

ACDR-OM Okay.

ACDR-OM ... for awhile ... Bo, how's your picture?

ACDR-OM Okay. ...

ACDR-OM Okay. That all right, Bo?

CMP-OM Yeah. She's wide open.

19 34 40 ACDR-OM It's wide open.

ACDR-OM Okay. ...

ACDR-OM Okay.

ACDR-OM Okay. We got - Alexey's on Deke's headset. How do you read, Houston?

ACDR-OM Understand. And Alexey has on Deke's headset.

ACDR-OM Yes, sir, Mr. President, I sure do. Out of the three docking systems I've used, this was the smoothest one so far. It worked beautifully.

ACDR-OM Well, it's a lot - -

19 39 36 SCDR-OM Mr. President, I'm sure that our joint flight is the beginning for future cooperation in space between our countries. Thank you very much for very nice words to us. We'll do our best.

ACDR-OM Okay.

DMP-OM No, sir, Mr. President, unfortunately.

ACDR-OM ...

19 41 19 DMP-OM Well, Tom just repeated it for me, sir. Well - yes, I have a lot of advice for young people, but I guess probably one of the most important bits is to, number one, decide what you really want to do and then, secondly, never give up until you've done it.

DMP-OM Okay. Yes, sir, it -

CMP-CM Mr. President, I'm - I believe it really has. I think, in a way, our project in - in particular, the training that we've undergone, has been a - sort of a model for future, similar projects. I think it's been a real pleasant experience to work on learning Russian and to be able to work with the cosmonauts, and I think we'll have some ideas that would probably help people in the future on similar tasks.

SFE-OM We having good spacefood. There are some Russian soup some Russian ... (laughter), some juice, some coffee, and a lot of water (laughter). No beer; no crab.

19 45 31 SCDR-OM Thank you very much.

ACDR-OM Thank you, Mr. President. It's certainly been an honor to serve the country and work here.

ACDR-OM Yes, sir.

ACDR-OM Deke?

DMP-OM ... Yeah.

19 46 47 ACDR-OM Okay. And that ... it. ... .. setup. You've got that set up ...?

ACDR-OM Houston, Apollo. Okay.

ACDR-OM Okay. You're ready for the presentation now, and how much more time we have on ATS, Bo?

ACDR-OM (Yes.)

ACDR-OM Deke, come on down.

DMP-OM Okay.

ACDR-OM We got 10 minutes here, and we'll do it real fast.

ACDR-OM Just a minute ...

19 48 24 ACDR-OM Right. Okay, Deke. Put on your helmet.

ACDR-OM Put it on TV.

DMP-OM Ready?

ACDR-OM ... (Laughter)

ACDR-OM (Alexey, Valeriy. Permit me, in the name of my Government and the American people, to present you with five flags for your Government and the people of the Soviet Union. May our joint work in space serve for the benefit of all countries and people on the Earth.)

SCDR-OM Your people ...

ACDR-OM Thank you very much, Alexey, thank you. (Thank you very much.)

ACDR-OM Roger. (Houston, says that - that they still don't hear you very well. Check your VHF FM.)

19 50 30 ACDR-OM Valeriy's checking it right now, Bo.

ACDR-OM (Yes.)

SCDR-OM Houston, Soyuz. How do you read me?

SCDR-OM ... Soyuz. How do you read me?

ACDR-OM Did you read Alexey then?

DMP-OM Yeah. ...

ACDR-OM Right.

DMP-OM If we're supposed to be on VOX, Bo, I think that's part of the problem. We're - we're ... or else not keying.

ACDR-OM (A very long day.)

SCDR-OM ...

ACDR-OM A very long day.

SCDR-OM ...

19 51 37 DMP-OM Yeah, we'll try that.

CMP-CM Can we turn up your VOX a little bit, Deke? That may help.

DMP-OM Oh, okay.

SFE-DV ...

ACDR-OM You got it okay. Valeriy's checked the VHF FM and he said it's ON. (Please speak in your headset.) Oh, ...

SCDR-OM Houston, Soyuz. How do you read me?

19 52 11 SCDR-OM Just now, Tom Stafford gave me - gave us little flags from American people and the - from American Government. Thank you very much for these very expensive present. Soyuz crewmen - gave Soyuz flags to Tom Stafford from our people and from our Government.

ACDR-OM (Thank you, Alexey.)

SCDR-OM A very long day, about 2-1/2 ...

ACDR-OM (Yes.)

MS-OM (Laughter)



DMP-OM Yeah.

19 53 02 DMP-OM ... me to help you?

ACDR-OM In AVERAGE not PEAK. Okay, in work. Is this over there?

DMP-OM I don't know. I can try it. ...

ACDR-OM There it is.

19 53 41 DMP-OM You get two choices there, Bo. Which one do you like?

ACDR-OM Lots better on the monitor.

DMP-OM That's better.

SCDR-OM ...

ACDR-OM Is that better, Bo?

DMP-OM Okay.

ACDR-OM What was it in?

DMP-OM Well, ... what I just put it in.

ACDR-OM (Laughter) Look at that in the monitor.

ACDR-OM Here you go. ... This goes in here. ... okay we got that done.

19 54 19 DMP-OM Okay ...

ACDR-OM ...

DMP-OM Right.

DMP-OM Hey, Tom? We got out U.N. flag?

ACDR-OM Stow flags in TSB.

DMP-OM Okay.

ACDR-OM Ha.

DMP-OM Huh? ... take that film.

19 55 40 ACDR-OM Roger. 1:38 transfer time.

DMP-OM Okay. What do we do next here, Thomaso?

ACDR-OM What time do you have?

DMP-OM I got 36:26 ...

DMP-OM Tell you, Tom, I think - I'll connect those connectors here ...

19 56 57 CMP-CM Roger. 181 the three TV POWER switches OFF.

ACDR-OM Cables come next.

DMP-OM Okay.

CMP-CM Okay. That's complete, Bo.

ACDR-OM Okay.

DMP-OM Okay. I'll look up the ...

ACDR-OM Okay.

CMP-CM Hey, Tom and Deke, how's dinner?

DMP-OM Oh, I don't know there. Haven't got to it.

ACDR-OM Oh, that's right. We're still - -

19 58 17 CMP-CM That's right. You're still getting ready to connect cables and stuff.

ACDR-OM Yeah.

DMP-OM Right.

ACDR-OM Yeah. We're a little behind on the cable connections here, and we'll get up and do that - -

CMP-CM Yeah. Hey, did you - did you get a call from the Soviet leaders? I never picked up.

19 59 34 ACDR-OM Yeah, we got a call, but it was just a - kind of an  
... up to the - both crews.

CMP-CM Kind of a speech thing?

ACDR-OM Right. It was a speech by Secretary Breshnev ...  
both crews.

CMP-CM Um hum.

ACDR-OM But I had the feeling Alexey ... to hear it.

CMP-CM I see.

DMP-OM Hey, Vance, I heard - I ain't heard nothing ...

CMP-CM Right. I - I didn't think I did either so I was a  
little - -

ACDR-OM ...

DMP-OM Okay. And I'm suppose to put TV camera back in A-7.  
This right? Camera in ...

DMP-OM ... verify.

20 00 01 DMP-OM Okay, Vance. I guess we got another comm configura-  
tion here.

CMP-CM Okay. I'm standing by.

20 00 11 DMP-OM Okay. MODE INTERCOM, PUSH TO TALK, and VHF AM ...

CMP-CM Okay, PUSH TO ... and VHF AM ... FM ... FM ...

DMP-OM Want the AM OFF.

20 00 30 CMP-CM And AM is OFF.

DMP-OM Roger. ... NORMAL and POWER, OFF.

20 00 33 CMP-OM NORMAL.

DMP-OM And POWER, OFF.

20 00 38 CMP-CM ... POWER, OFF ... Oh, POWER, OFF. Okay? Right.

20 03 11 CMP-CM (Soyuz, Apollo.)

SCDR-OM Go ahead.

CMP-CM (You all ready; your cabin?)

20 06 00 SCDR-OM ..., Vance?

SCDR-OM How do you read me?

CMP-CM Loud and clear, Alexey. (Are you ready?)

SCDR-OM Yes.

CMP-CM ...

SCDR-OM ...

CMP-CM Okay, how do you read, Dick - Deke?

DMP-OM Okay, I got you now.

ACDR-OM Got you loud and clear, Vance. How us, okay?

CMP-CM Yeah, loud and clear.

DMP-OM Okay, I'll go ahead and ... Soyuz power DM breaker ... power ... there.

20 06 54 DMP-OM Okay, AUDIO 1, POWER, OFF. ...

20 07 47 CMP-CM Okay, Deke, how do you read now without ...?

ACDR-OM Okay, Deke, ... hooked up?

DMP-OM Okay. ...

ACDR-OM All right.

DMP-OM ... VOX.

ACDR-OM (Laughter) ... Tampico ...

ACDR-OM Let me help you. ...

DMP-OM (Laughter)

DMP-OM Take one thing at a time here and we may ...

20 09 05 ACDR-OM Okay.

20 15 12 ACDR-OM (Laughter) ...

20 15 30 CMP-CM (Alexey, are you ready for inertial orientation?)

20 15 40 CC-H Apollo, Houston. We're going over the hill here at Vanguard. We'll see you at MILA at 17:00.

CMP-CM Roger.

20 15 49 SFE-OM We're ready for orientation.

CMP-CM (All right. We will be doing inertial orientation.)

DMP-DM Okay. When you're ready, Tom.

20 16 04 ACDR-OM Yeah, I'm trying to - get this thing fixed. ...

20 17 06 DMP-DM Okay, Tom. Whenever you want it, I've got the TV cable with the adapter on it for you.

20 17 14 ACDR-OM Okay. You got the adapter and all that?

DMP-DM Yeah.

ACDR-OM Would you like to install it? ...

DMP-DM Yeah; I'll just go up there and do it. ...

ACDR-OM ... a 180 here.

DMP-DM Okay.

20 17 35 ACDR-OM (Laughter)

DMP-DM ... 180 ...

DMP-DM Okay. And, Vance, if you're reading me - you're supposed to select SLAVE on the CM camera.

20 18 32 CMP-DM Okay. SLAVE now.

20 18 40 DMP-DM Okay. I unstow ... Now, let's see ...

20 18 59 ACDR-OM Okay; POWER, ON. Now - (Laughter)

DMP-DM Yeah. I got this whole bundle of ... adapters, whenever you want ...

ACDR-OM Okay. I got a feeling - have you got a thing on your checklist where I install this TA-3 with the ...?

DMP-DM Ah; let's see -

ACDR-OM You're looking for step 33, Deke, but it doesn't say what - what ... reroute cable as required, but it doesn't say what to put on the ...

DMP-DM ... required. No, it sure doesn't. Ah - no, wait a minute - Reroute cable -

ACDR-OM That's all it says.

DMP-DM ... cable ...

20 20 01 ACDR-OM What happened, we had an interference with ...

ACDR-OM Ah ... Can you move that ... a little bit? ...

20 21 33 CMP-CM (The first maneuver has been performed. Orientation established.)

SFE-OM Roger. Apollo maneuver is completed.

20 21 42 SCDR-OM Apollo-Soyuz maneuver is - are completed.

CMP-CM (Exactly.)

20 22 32 DMP-DM Tom, you're about to get your second biggest thrill of the day.

ACDR-OM What's that?

DMP-DM Well ... I got to get over ...

ACDR-OM (Laughter) Good.

20 23 04 ACDR-OM Let me get out of - I'll get out of your way - here - -  
DMP-OM Okay.  
ACDR-OM Here do you want me to take that?  
DMP-OM Yeah.

20 23 09 ACDR-OM Much better than the mockup.

20 23 36 DMP-OM AUDIO 2, ON; verify ... Okay, Vance. I'm supposed to power up the old speaker box here and check the volume as required with a comm check.  
CMP-CM Okay.  
DMP-OM Give us a little bit of help in there, we'll try it.  
CMP-CM All right.  
DMP-OM ...  
DMP-OM Okay; how do you read, Vance?  
CMP-CM I read you plain.

20 24 06 DMP-OM All right ...

20 25 10 DMP-OM Okay. We're about - 15 minutes behind here, I guess. ... certify the first international docking ... joint eat period.  
ACDR-OM Yep.  
DMP-OM ... I feel like I'm ...

20 26 18 ACDR-OM Okay, Deke. I think that does it. (Laughing)  
DMP-OM ...  
ACDR-OM There's so many things - - (laughing)  
SCDR-OM Sure!

20 26 32 ACDR-OM Yeah.  
DMP-OM Okay. DAC ...

20 26 46   ACDR-OM   ... the DAC 01 settings? ...

          ACDR-OM   DAC on 01 ... X, 0; Y, 270; Z, 310.

          DMP-OM   ..., 0, Y ...

          ACDR-OM   Hang on, Deke. ... Y ...

          ACDR-OM   ...

20 28 50   DMP-OM   ...

          ACDR-OM   I think I'm going to just disconnect here and wait  
                    for that - -

          ACDR-OM   ... back here.

          DMP-OM   Okay. I've got this one ... the DAC, but I don't  
                    know ...

          ACDR-OM   Okay.

          DMP-OM   Where'd you stow the mag?

          ACDR-OM   Here you go.

          DMP-OM   ... it was lying here, I think.

20 31 03   SCDR-OM   (Moscow ... How do you read?)

          SFE-OM   (...)

          ACDR-OM   ... table. Yeah?

          SFE-OM   ... picture.

20 31 43   DMP-OM   Okay. Think I done pretty good.

          DMP-OM   Okay. Now, I wonder if I can see you here;  
                    Valeriy - -

          SFE-OM   How do I ...?

          ACDR-OM   Let's ... Vance here. Okay. I've got to check  
                    through this book.

          DMP-OM   I can check it for you, I think.



ACDR-OM You did?

DMP-OM Oh, boy. ...

CMP-CM ...

ACDR-OM Tell Vance to check.

DMP-OM Hey, Vance, go to select - -

CMP-CM ...

DMP-OM They're receiving him ... But I think that's right.

ACDR-OM Yeah. That's a bad ...

DMP-OM ...

ACDR-OM Yeah. Okay.

DMP-OM Okay.

20 33 18 CC-H Apollo, Houston through MILA for ... ..

ACDR-OM Okay. I've got a little bit of a squeal here. I don't know whether it's ... the speaker box is on.

DMP-OM Yeah. I - -

ACDR-OM Let me turn this one off.

20 33 48 ACDR-OM How do you read now?

CC-H Read you better now.

ACDR-OM Okay. ... the speaker box in here. I'm going to turn the speaker box off as long as we're in Soyuz.

CC-H Roger; we understand.

ACDR-OM Okay, Vance. How do you read?

CMP-CM Loud and clear.

ACDR-OM Okay. \*\*\* panel 808, UTILITY POWER - -

ACDR-OM Okay, Vance. Select ... - -

ACDR-OM Roger. How do you read, Bo?

CC-H Tom, we read you rather weakly.

CMP-CM ...

ACDR-OM Okay. You've already done it. Okay.

CMP-CM Tom, I couldn't hear you. What did you say?

ACDR-OM Okay. The step's already completed.

20 35 20 DMP-OM Okay. The next thing we're supposed to do is that docking ... thing, I believe. ... in the other checklist that we - -

20 36 05 CC-H Apollo, Houston. We will go LOS in less than a minute. We'll see you on ATS at 56:20.

ACDR-OM Roger.

ACDR-OM What's that in, phased elapsed time and transfer time, Bo?

CC-H I'll have to look that up, Tom. Hold on just a second.

20 36 39 CC-H Right now, our transfer time is 2:05, and we'll have ATS at about 2:10.

ACDR-OM Roger. ATS in 5 minutes. Thank you, Bo.

DMP-OM Okay.

ACDR-OM ...

DMP-OM Okay. ... thing first there.

20 37 41 ACDR-CM I guess the next thing is to sign those joint documents. Right?

SCDR-OM Joint documents?

ACDR-OM Yeah. ...

DMP-OM Yeah.

ACDR-OM (Joint documents.)  
SCDR-OM ...  
ACDR-OM Yeah.  
DMP-OM I think Alexey should be over here, ...  
ACDR-OM Yeah.  
SCDR-OM ...  
DMP-OM I'll hold it for you.  
SCDR-OM ...  
SCDR-OM Huh?  
20 39 32 ACDR-OM That was JFK.  
SCDR-OM Oh. ...  
CMP-CM Huh.  
SCDR-OM ...  
ACDR-OM (...)  
SFE-OM (...)  
ACDR-OM (Okay.)  
SFE-OM (...)  
ACDR-OM (Oh, okay.)  
CMP-CM Hey, you know, whoever was supposed to check all  
the frequencies goofed up, didn't they?  
DMP-OM Yeah. They really didn't do very well, did they,  
Vance?  
ACDR-OM ... frequency?  
CMP-CM No. Whoever was supposed to check all the frequencies  
- - failed to do so.

ACDR-OM I know.

CMP-CM - - failed to do so.

SCDR-OM ...

DMP-OM Well, let me get up out of the way here so Alexey can get over there.

ACDR-OM Ho, Alexey?

SCDR-OM Yes?

20 41 19 ACDR-OM Wait until I turn this ... on this ... cable. That's all right. No. Let's ... to the left here, I think - right here, yeah. On this seat. ... not quite as familiar, but - -

DMP-OM It's okay... ..

DMP-OM Okay.

20 41 58 CMP-CM Loud and clear, Bo. And we've shift - switched off the VHF/FM for a while.

20 42 05 CC-H ...

ACDR-OM ...

DMP-OM So you do.

20 42 14 CMP-CM Stand by.

SFE-OM ... (Laughter)

DMP-OM Okay. Now.

SFE-OM What you think?

DMP-OM Tres boune. Here, I'll just put it anywhere I think is right.

20 43 10 CMP-CM Okay, Bo. You've got VHF back too.

DMP-OM ...

ACDR-OM They wanted us to put it on that - back.

CC-H ...

DMP-OM ...

ACDR-OM (Yes.)

CMP-CM Roger.

CMP-CM Okay. You want to just - want to turn on this - -

ACDR-OM Try it that - no, just - back. That's all right.  
(...)

SCDR-OM All right.

20 43 50 DMP-OM Beats me. I don't know.

ACDR-OM Yeah.

SCDR-OM ...

ACDR-OM (Yes. Apollo.)

SCDR-OM (Apollo.)

ACDR-OM (Yes, yes, this is ... Dr. Lunney asked me to tell  
it to you in Russian onboard Soyuz when we are rest-  
ing there, and when you are onboard Apollo ...)

DMP-OM Okay. While they're doing that camera, I'll just -  
Oh, okay. I'd better put the camera cards ...

20 44 32 SCDR-OM (George, we have an awful lot of work here, and we  
haven't paid any attention to that. We just can't  
find those joint documents.)

SCDR-OM Okay, Tom Stafford and Deke Slayton are sending best  
wishes to you.

CMP-CM (The command module also sends its greetings.)

DMP-DM Okay. I'll turn that on, whatever - what - we have  
the docking up here. Do you have the checklist? ...

20 45 32 ACDR-OM Go ahead, Bo.

ACDR-OM That's affirmative. I did.

ACDR-OM No. I'll recheck it but - -

ACDR-OM Is the speaker box on up there in the docking module?

DMP-OM Yeah, that one's on.

ACDR-OM The speaker box is on in the docking module.

DMP-OM Don't you want that one on, Bo? It's supposed to be on per the Flight Plan but we can turn it off.

DMP-OM Okay.

ACDR-OM Got it off?

DMP-DM Okay. It's off. Is that any better?

ACDR-OM How do you read now, Bo?

ACDR-OM Yeah, I can tell, we don't have a squeal now.

DMP-DM Okay.

20 46 59 DMP-DM Okay. I thought it was. I'll check it.

DMP-DM Okay. How does that look to you?

ACDR-OM (...)

20 47 28 DMP-DM I can't tell much on this monitor, Bo. So you guys check it and let me know when you like it.

20 47 35 ACDR-OM (...)

20 52 48 ACDR-OM (Laughter) Houston, Apollo.

CC-H Apollo, Houston. Go ahead.

20 52 53 ACDR-OM Yeah, Bo. Are you getting any picture in the orbit - in the Soyuz now, in the orbital module? All I can get on my monitor is just the screen. It's really brightened out.

ACDR-OM Okay. Thank you.

CC-H ... down through the hatch, and we see that quite well.

SCDR-OM Okay.

CC-H The other camera we were getting a picture on, but you're often in front of it. But that's just supposed to be a stowage location for that camera.

ACDR-OM Okay.

20 53 37 ACDR-OM Okay. We got the document set up.

CC-H Roger. You're getting ready ...

ACDR-OM We're going to sign the document soon. Roger.

20 54 01 CC-H Tom, we're looking over your left shoulder now, and we see the table quite well. So if you're getting ready to sign the certificate, that should be a good shot.

ACDR-OM Okay.

20 54 37 ACDR-OM Turn that one on, too. Turn that one on, too.

ACDR-OM Got it?

CMP-CM No, ...

ACDR-OM God damned ... Okay ...

ACDR-OM Okay, Alexey.

ACDR-OM (Laughter)

20 56 38 ACDR-OM It's right over here.

CMP-OM Sounds like you guys are working instead of partying.

20 56 55 DMP-OM Yeah. We're ready to break out the cognac, vodka, and that stuff ...

DMP-OM ... There it is. Okay. I'll go recover it. Okay.

ACDR-OM Okay. Are you ready?

DMP-OM ... There you go.

ACDR-OM I'll get a picture if you'll hold on a minute.

ACDR-OM ... picture.

SCDR-OM That's cute.

ACDR-OM Okay. ... on its way up there. ... Got it.

ACDR-OM (Laughter)

DMP-OM That was the other one.

DMP-OM What about the ... over there, Tom?

ACDR-OM Yeah. ...

ACDR-OM ... on.

DMP-OM What are you on?

ACDR-OM 01.

21 01 49 ACDR-OM Yeah, I got the light.

CMP-CM Rog. Can do, Bo.

21 03 21 CMP-CM It's all the way open, Bo. Has been.

DMP-OM Shoot the mag on the meal.

ACDR-OM Shoot the mag on the meal. We have another bag ...

DMP-OM Let's see. Okay. I have six mags for the hand held.

ACDR-OM Yeah.

DMP-OM Panorama ...

ACDR-OM Yeah. I wonder how much we have on the ...

ACDR-OM Okay, got about 34 more feet.

DMP-OM ... a bunch of pictures.

MS-OM (Laughter)

21 06 25 ACDR-OM We got to get a picture of this. Hey, Deke. Let's get a picture of this.



DMP-OM Yeah, we got to.

ACDR-OM Turn that off and ...

DMP-OM ... idea.

ACDR-OM Get over here.

21 07 39 ACDR-OM Houston, Apollo.

ACDR-OM Yeah, Bo. Do you have a camera on in the orbital module? A TV camera?

ACDR-OM Let's take a look at the one in the orbital module.

DMP-OM ... read the label.

DMP-OM In English, you spell that c-o-c-k-a.

21 08 39 ACDR-OM What is the joke?

DMP-OM (Laughter)

21 13 13 ACDR-OM Go ahead.

ACDR-OM Sure thing. Right now, I've just finished some strawberries, reconstituted. And Deke and I - Deke's eating some too. We're getting ready to eat some borscht, that you can see here.

ACDR-OM Got the tube?

ACDR-OM After that, I'm going to have turkey with cran - apple and cranberry sauce. Also, I have apple juice here, which they made a little joke, and it has a different label on the other side of it. This is (unusual juice). This is something different. It's apple juice.

DMP-OM My menu is borscht, ..., Roquefort cheese, apple and cranberry, and apple and plum sticks, and sweet apple juice. You can tell I like apples.

21 15 01 ACDR-OM And this is "Jantar" cheese, known as "syr Jantar."

21 15 19 ACDR-OM And here is Russian bread, known as "..."  
 SCDR-OM ...

21 15 24 ACDR-OM Little bitty, whole miniature loaves of it. (...)  
 SFE-OM Turkey.  
 ACDR-OM Turkey, which is "indeyka" (in Russian).  
 SFE-OM Hey, Tom.  
 ACDR-OM Get those ...  
 DMP-OM I don't know which it is ...? Oh, yeah.  
 ACDR-OM ...

21 17 14 DMP-OM ... off the ...  
 SCDR-OM Yes.  
 ACDR-OM Yeah.  
 SCDR-OM ...

21 18 30 ACDR-OM (...)  
 SFE-OM Oh. (Yes.)  
 SCDR-OM ...

21 19 08 DMP-OM (...)

21 19 28 ACDR-OM It should be out of film now.  
 SFE-OM ...  
 ACDR-OM I'm going to take the ... and come around to the other one.

21 19 50 ACDR-OM Houston, how much more time do we have on ATS?  
 CC-H ...  
 ACDR-OM Okay.

ACDR-OM I guess you're getting a good picture from the dock-  
ing module looking down here in the tunnel, right?

CC-H ...

ACDR-OM Okay.

ACDR-OM Here's cranberry dressing.

SFE-OM (Ah.)

ACDR-OM You always have to have cranberries with turkey,  
right?

DMP-OM ...

CC-H ...

21 20 42 ACDR-OM Usually have that with turkey.

CC-H Roger.

ACDR-OM What?

DMP-OM We'd better find out. Be better ... pictures ... on  
ATS. Okay. If you ... back to ...

ACDR-OM Yeah. Very good.

DMP-OM ...

21 21 21 CMP-CM Go ahead, Bo. Okay. ...

21 21 37 ACDR-OM Oh. We got the ...

DMP-OM Tom, do you need this ...?

21 22 23 ACDR-OM Ah. (Okay.) Oh. Yeah, Deke.

DMP-OM Move up here.

DMP-OM Okay. ...

DMP-OM Got the film.

SCDR-OM Huh?

DMP-OM ...

21 23 48 ACDR-OM Oh, Deke.  
DMP-OM Okay.  
ACDR-OM Move over ... Scoot over, Deke.  
DMP-OM ...  
21 24 29 CMP-CM (...)  
SFE-OM (Laughing)  
DMP-OM Yeah, Vance, we ... (Laughing)  
CMP-CM Can't get it out in a 5-psi atmosphere.  
CMP-CM We had turkey over here tonight, too.  
DMP-OM You did?  
CMP-CM Big turkey night.  
DMP-OM Looking ... over here, eh?  
21 25 05 CMP-CM Well, just a little bit. (Laughing)  
21 25 11 ACDR-OM We have room for you, Vance.  
DMP-OM (...)  
DMP-OM Yeah. Have to have the combination of that can opener. Oh. (Laughing) Let's see, Alexey.  
21 25 52 ACDR-OM Let me float up and get a picture.  
DMP-OM We got some film ... in here?  
ACDR-OM Yep.  
ACDR-OM You've got plenty - -  
21 26 13 DMP-OM ... this damned decal.  
21 27 05 ACDR-OM 1/250. Ah.

21 29 09 CMP-CM Okay. Three switches coming OFF.

21 29 15 ACDR-OM (...)

21 29 54 ACDR-OM Ah. What?

ACDR-OM All right, Bo. Sure will.

CMP-CM And we got one of our standard alarms, Bo.

DMP-OM You want to see a ...? Super.

SFE-OM Where to put this tool?

DMP-OM ...

SFE-OM What?

DMP-OM ...

21 30 41 SFE-OM ... this tool ...

DMP-OM ... .. If we have it.

21 31 48 CMP-CM Tom - -

21 32 16 ACDR-OM What's the problem? ...

DMP-OM Changing filters. ... changed it to panorama. ...

ACDR-OM Okay. I've - think I've got a ... wrench here.

DMP-OM Can you do it?

21 32 37 ACDR-OM Yeah. ...

ACDR-OM DAC 01, 10 millimeter ...

21 34 29 ACDR-OM ...

21 34 35 ACDR-OM Okay. That's ...

ACDR-OM (Laughter) You're right.

CMP-CM That ought to make a pretty good picture, Tom.

ACDR-OM Okay. That ought to do it.

21 37 43 CMP-CM ... Tom.

ACDR-OM We don't have to.

CMP-CM ...

CMP-CM Thought you guys really had vodka over there.

ACDR-OM So did we, man. It really looks like it.

DMP-OM Vodka.

21 39 11 ACDR-OM Thank you. Vodka.

21 40 48 ACDR-OM (Laughter)

21 48 32 ACDR-OM ... here.

DMP-OM ... Let's see; this is ... here.

ACDR-OM (...)

DMP-OM Hey! Where did that come from?

ACDR-OM I had a book here - -

DMP-OM We don't do anything else here inside, do we, Tom?

ACDR-OM I have my book here ... went away.

DMP-DM Well, I'll tell you what, I got to go up here anyway and get that furnace thing going. ...

ACDR-OM Okay.

DMP-DM Okay.

DMP-DM See what I can find up there. ....

21 50 05 DMP-DM We already run it through ...

DMP-DM (Laughter) Yeah. I know.

ACDR-OM ...

DMP-DM Right.

ACDR-OM ...

21 50 58 ACDR-OM (Laughter)

DMP-DM I was looking around, Tom; I don't see your book up here.

ACDR-OM Was this yours?

DMP-DM No, I didn't have one.

ACDR-OM Okay. Well, this is mine then.

DMP-DM Yeah; Okay. Yeah, that'll do beautifully. (...)

DMP-DM Yeah.

ACDR-OM Where is that ...

DMP-DM Uh, aha (laughter) ...

21 52 53 DMP-DM My God. Oh. That's beautiful. ... we could get a picture of that ...

ACDR-OM Oh yeah.

SCDR-OM ...

21 55 12 DMP-OM (... Alexey.)

DMP-DM ...

ACDR-OM Yeah.

DMP-DM ... the hole there. Oh! (Laughter) Went right down that hole. Well, maybe it'll come out again. I think there was air blowing through there.

MS (Laughter)

ACDR-OM Do you see them, Deke?

DMP-DM What?

ACDR-OM Do you see them?

21 56 27 DMP-DM No ... - -

ACDR-OM Yeah, I think I - I caught one just as it was floating away ...

DMP-DM The other one went down that hole there.

21 56 43 ACDR-OM (...)

ACDR-OM Okay ...

ACDR-OM Okay, let me go up ...

DMP-DM ... yeah; while I'm up here.

CMP-CM Yeah.

DMP-DM Well, I'll go on up and get the furnace thing going.

21 57 36 ACDR-OM I'll ...

DMP-DM Okay, thank you.

ACDR-OM This connect back in over there?

DMP-DM I don't know, Tom; I'll check here. I'm not sure.

ACDR-OM All right.

DMP-DM Probably not yet.

CMP-CM Hey, I'm leaving a light on on the porch for you guys.

MS ... yeah ...

DMP-DM Thanks. ... up there in the CM.

ACDR-OM ...

DMP-DM Uh-huh.



21 58 23 ACDR-OM Hey, Alexey. Alexey. (Laughter)

21 59 13 DMP-DM Okay. (...)

21 59 19 CC-H Command module, Houston through Goldstone. How do you read?

CMP-CM Loud and clear, Bo; ...

21 59 41 CC-H Command module - -

22 05 40 CC-H Apollo, Houston. There is 1 minute until LOS. We'll see you on ATS at 57:52.

CMP-CM Roger. Understand.

SFE-OM ...

CC-H About 3 hours and 41 minutes, transfer time.

CMP-CM Okay, and we have most of the presleep checklist done in advance.

22 05 58 ACDR-OM (...)

CMP-CM Did you want an E-memory dump tonight, Bo?

CC-H Understand you've got most of the presleep finished.

CMP-CM Rog. One item on it is the E-memory dump, and I wondered if you'd like to have that.

CC-H Vance.

CMP-CM Page 1-49, about the fourth thing down, E-memory dump.

SCDR-DV It's off.

CMP-CM VERB 74.

DMP-DM Okay.

SFE-OM Okay.

DMP-DM What about the sequence?

SCDR-DV 10.

SFE-OM 4.

22 06 35 DMP-DM (Okay, very well.) Stand by to ...

SFE-OM Vance ...

DMP-DM Okay.

SFE-OM ...

DMP-DM Huh? That's it. There.

SCDR-DV Hey, Deke.

22 07 03 DMP-DM Huh? Hey, Bo; DP.

CMP-CM He's gone.

DMP-DM They're looking for you.

CMP-CM Okay.

ACDR-OM They're taking pictures, ... off.

DMP-DM I think that answers my question, the question involving what ... TV setup for the furnace thing. ... wouldn't have any - -

SFE-OM ...

DMP-DM - - anybody ... anyway.

22 07 29 CMP-CM We're coming up over ATS pretty quick though.

DMP-DM We are?

CMP-CM Yeah. We're over the United States right now.

22 07 48 ACDR-OM Okay.

SFE-OM ...

22 08 15 ACDR-OM (...)

SFE-OM ...

22 08 19 ACDR-OM (Very good. Yes.)

22 08 44 ACDR-OM Okay, Deke. Let me grab hold right here.

DMP-DM Huh? Oh.

SFE-OM ...

22 09 02 ACDR-OM (Which hatch?)

SFE-OM Yeah?

22 09 35 ACDR-OM (Hatch number 4.)

SFE-OM ...

DMP-DM ...

SFE-OM ...

DMP-DM Okay.

SFE-OM Yes. ...

DMP-DM ... Aw.

22 10 30 ACDR-OM (...)

22 10 54 ACDR-OM (Thank you, very nice ...)

22 11 02 DMP-DM (...)

SFE-OM ...

22 11 16 ACDR-OM Oh. (Okay, okay, okay.)

22 13 11 CC-H Apollo commander, Houston. It looks as if Moscow was trying to call - -

22 16 20 DMP-DM Yeah. (...)

22 16 31 ACDR-OM Right.

SFE-OM ...

22 17 11 ACDR-OM ... Aw, Deke. ...

22 18 01 ACDR-OM Deke.

22 18 04 ACDR-OM Ah. (Thank you.)

22 18 22 CMP-CM Go ahead.

22 18 39 CMP-CM Sure.

22 18 40 ACDR-OM Ah. (Thank you.)

ACDR-OM ... Apollo.

22 19 18 CMP-CM Okay. Houston, Apollo. Got a P52 option 3 here for you a few minutes early, if you're watching.

22 19 37 ACDR-OM (Valeriy, come into the docking module.)

DMP-DM Okay. ...

ACDR-OM (Valeriy, ...)

#### TIME SKIP

23 34 01 CC-H Apollo, Houston. We're AOS through Goldstone and we've got you for 3 minutes.

ACDR Okay.

CC-H Apollo, Houston. AOS through Goldstone for 3 minutes.

ACDR Roger. Read you loud and clear. How us?

23 36 50 CC-H We'll see you at Newfoundland in 7 minutes. And just hold up on that pressure thing. We'll try to talk to you a little bit more about it then.

DMP ...

23 44 04 CC-H Apollo, Houston. We're AOS Newfoundland and got you for a total of about an hour here. And we've coordinated with Moscow, and you're GO to continue in your procedures with the delta-P integrity check that we've had.

ACDR ...

CC-H Copy that. Press on with it then. Get it out.

ACDR ...

CC-H I guess we're - we're just going to go ahead and continue with no action right now and just keep a - keep an eye on it.

ACDR ...

CC-H That is affirmative, Tom. We want you to continue on.

23 45 17 ACDR Okay. Real good.

# # #

DAY 199

08 17 00 USSR ...  
USSR (Are you pleased with ...?)  
USSR (This is Soyuz. How is the picture?)  
USSR (....)  
08 18 01 USSR (This is, Kolya, not the filter, but the filter  
arc.)  
08 18 21 USSR (Look ...)

TIME SKIP

09 06 50 ACDR Yeah, you take ...  
09 07 07 ACDR How do you read, ...?  
ACDR Okay, ...  
09 07 57 ACDR Pardon me?  
ACDR ...  
ACDR Okay, Vance, I'll disconnect ...  
09 12 28 ACDR Hello, Houston, Apollo.  
09 17 16 ACDR (Soyuz, Apollo. How do you read me?)  
SCDR Loud and clear.  
ACDR (We are in the docking module.)  
SCDR Okay.  
09 18 41 ACDR I guess I'll be doing the helium inject and looking  
at the - I'll be the one in here ... I'll take care  
of that.  
ACDR All righty. It looks like we're clicking away on  
schedule this morning, Bo.  
ACDR Stand by.  
ACDR Go ahead.

09 25 36   ACDR   Roger, Bo. We're standing by on page 4-2. Go ahead.

          ACDR   Houston, how do you read?

          ACDR   Hello, Houston, Apollo. Oh, just ... Yeah. Hello, Houston, Apollo. Yeah. ...

09 27 05   ACDR   Hello, So - Soyuz, Apol - Apollo. (How do you read?)

          SCDR   5 by 5, Tom.

          ACDR   (Roger, I read you too.)

09 27 19   ACDR   Hello, Houston, Apollo. How do you read?

          ACDR   Okay, Bo. You just dropped out completely there. We are on page 4-2 waiting for your instructions.

          ACDR   Okay. So in other words, we'll just be - I understand, when I inject the helium to the 150 but do the cool-down time. We just won't take it out then and deactivate it.

          ACDR   Okay. Real fine. Thank you.

          CMP    What time?

09 28 36   ACDR   Oh, I'm not anywhere near it yet.

          ACDR   Yeah.

          CMP    Go ahead, Bo.

          CMP    You'll just have to stand by there a minute, Bo, ...

09 31 21   SCDR   ... Soyuz. What steps are you doing now?

          ACDR   (Now we are working at ... Vance, speak further.)

          CMP    ... you reading me?

          DMP    Yeah, I'm reading you guys.

          ACDR   ...

          ACDR   ...

09 32 25 ACDR ...

CMP Yeah.

ACDR ...

09 33 05 CMP Okay. The three POWER switches on 181 were just turned on, Bo.

09 33 31 CMP (Soyuz, Apollo. Hatch number 2 is closed.)

SCDR We are finishing step number 8.

CMP (...)

ACDR (Soyuz, Apollo. We are now starting pressurization in docking module.)

USSR ...

ACDR Okay, Deke. We're pressurized.

DMP Okay. I'm going to give up on ...

09 35 45 ACDR Okay, Bo. We're pressurized in the docking module ...

CMP (Soyuz, Apollo.)

SFE Go ahead.

CMP (Please switch off our speaker box in the orbital module.)

USSR ...

USSR (Turn it off.)

CMP (Do you understand?)

09 37 04 ACDR (Soyuz, Apollo. Right now I'm in the docking module. Pressure, 490 millimeters mercury. Over.)

ACDR Roger. We're doing a pressure integrity check here, Bo.

ACDR (Good morning, I think that it is very early in Houston, isn't it?)



CMP Bo, ... We don't see you on the screen now.

DMP (... important ...)

ACDR (Right now we are working on part 9.)

CMP Are you still getting that squeal, Houston?

09 38 50 CMP Okay. We asked them to turn off the box, and I think - -

DMP Want us to turn off this one in here?

CMP - - and I think that Valeriy indicated that they've done that.

09 38 59 ACDR Bo, do you want us to turn off - Let me turn off the speaker box here in the docking module.

ACDR Okay. How do you read now? Is that better?

ACDR Say again, Bo.

ACDR Okay. We just turned off the speaker box in the docking module.

09 39 27 CMP Just for your information, the volume was all the way down on the speaker box, but it takes turning the switch off to really kill that noise.

09 39 52 CMP The fish look healthy this morning, Bo.

CMP Yeah, we have them over here on the wall. They're swimming around happily.

09 40 09 ACDR (We have a lot of fish, yes, Bo?)

ACDR (Laughter)

ACDR It sure was. I shot all kinds of pictures of those little rascals, but that was done down in the command module.

CMP That's just the way it was, but we can do that again.

09 40 56 CMP Okay. You're in that configuration now with the speaker box.

ACDR ...

09 42 12 CMP (Soyuz, ...)

ACDR (Soyuz, our step 9 is completed. Over.)

SFE Roger. Step number 8 is completed.

ACDR (We have also completed 9.)

SFE Tunnel 2 pressure equalized.

ACDR (Roger.)

CMP (Valeriy, the partial oxygen pressure of carbon dioxide is 4.)

CMP Go ahead.

CMP Rog.

09 44 14 SCDR ... opening hatch number 4.

ACDR (Roger.)

CMP Valeriy, Vance. (Is your speaker box turned off?)

09 45 24 SFE (Yes.)

CMP Bo, he answered that he did.

09 45 38 SFE Number 4 is open.

DMP (Hatch 4, OPEN.)

CMP ... equalize.

DMP (I am equalizing the pressure between the docking module and Soyuz.)

USA (I just completed ...)

09 46 45 ACDR (Soyuz, Apollo. Please prepare Apollo TV camera. Over.)

ACDR (Turn on Apollo TV camera, please.)

CMP Deke, how do you read?

DMP I'm reading you okay, Vance.

CMP ... read me? Tom, do you read me?

09 47 30 ACDR Yeah, about 3 by. Would you select SLAVE on the CM TV camera, please?

CMP ...

ACDR Okay.

CMP ...

ACDR ...

CMP ...

ACDR ...

ACDR (... I am opening hatch 3.)

CMP Is the TV okay now, Bo?

CMP Rog. Is your TV okay now?

CMP Good.

09 53 35 ACDR-DM Okay, Bo. I'm transferring the TSB into Soyuz. We're working on step 16.

09 54 01 CMP-OM Okay, Tom. Do you read?

ACDR-DM Reading you loud and clear, Vance.

CMP-OM Okay, we're in the orbital module and up on comm here.

ACDR-DM Okay. (Step 16 carried out.)

ACDR-DM Looks like a bunch of snakes in there, Valeriy.  
(Laughter)

DMP-CM ... O<sub>2</sub> fuel cell purge, but don't worry about it.

SCDR-OM Valeriy, but I am going to go to Apollo spacecraft.

MS (Yes, yes.) (Laughter)

SCDR-OM That is right.

CMP-OM (Yes.)

09 55 11 SCDR-OM Valeriy, ... nitrogen. Going to go.

ACDR-DM (... nitrogen.)

09 55 17 ACDR-DM (Nitrogen.)

TIME SKIP

10 35 12 ACDR-DM Roger. 70:30

CMP-OM ...

ACDR-DM Okay, Vance, I've got in 200 millimeters.

ACDR-DM ... Okay, coming up on 270.

10 36 02 ACDR-DM Close it.

10 36 10 SCDR-OM Okay. Pressure is 265.

10 36 12 ACDR-DM (Roger. I am beginning to perform step 25.)

10 37 58 ACDR-DM Okay, Deke. We're about a ... we're running 3 minutes behind. We're doing that tunnel 3 and 4 pressure integrity - hatch 3 and 4 integrity check.

10 41 32 ACDR-DM Okay, Vance. How do you read?

CMP-OM Loud and clear.

ACDR-DM Okay. At the end of 5 minutes, as far as ... here, I'm still right on 275. As far as I'm concerned, hatch 3 and 4 are GO. ... due to thermal cooling.

ACDR-DM (Soyuz, this Apollo. Your ... normal. Over.)

CMP-OM (Roger.)

SCDR-OM Roger.

DMP-CM ...

ACDR-DM Say again, Deke.

DMP-CM ...

ACDR-DM Okay. I can't - I can't hear - I can hardly hear you. Could you tweak your volume up?

DMP-CM Got the 5-millimeter lens ...

10 42 46 ACDR-DM Okay. The 5-millimeter for the DAC, Deke - ... it's eit - it's either up in F-2 or it's over in that right-hand - in that TSB that's down by the water gun.

CMP-OM Did you hear Valeriy, Tom?

ACDR-DM No.

SFE-DV Apollo, Soyuz. The results of our integrity check are also okay.

ACDR-DM (Roger.)

10 43 30 ACDR-DM Okay. Okay. I'm - seems our ... is the docking module depressurization.

DMP-CM ...

10 52 23 ACDR-DM Hello, Houston, this is Apollo. Okay. We're now on step 27.

CC-H ... we would like to have ...

ACDR-DM All right.

10 54 42 CMP-OM And, Bo. Please give us this information again about which switches to check in here in Soyuz.

10 55 05 CMP-OM Thank you.

10 56 03 CMP-OM ...

10 56 12 ACDR-DM Okay, Deke, I've finished. ... the CM-DM pressure equalization. You ready?

SFE-OM (Alexey, how do you read me? Over.)

10 56 49 ACDR-DM ... I'm equalizing pressure.

CMP-OM Okay, Alexey. (How do you read?)

ACDR-DM Okay, ... that spare Snoopy's back in ..., below that Earth obs - Earth observation ...

SCDR-DM (I do not hear.)

SFE-OM (How can't you hear? We hear you.)

SCDR-DM (I hear.)

SFE-OM (Yes?)

SCDR-DM (Yes.) Okay; loud and clear.

SFE-OM (Let's finish.)

CMP-OM (Yes.)

CMP-OM Houston, that fixed the problem. (Everything is normal now.)

SFE-OM (We hear you. We hear you.)

SCDR-DM Okay. Vance, how do you read me?

CMP-OM (Excellent, Alexey.)

SCDR-DM Deke, how do you read me?

DMP-CM (Excellent, Alexey.)

SCDR-DM Hey, Deke, how do you read me?

DMP-CM (Excellent, Alexey.)

SCDR-DM Okay.

10 58 01 SCDR-DM (Valeriy, we are opening hatch number 2.)

ACDR-DM Okay. I'm going to open hatch 2.

ACDR-DM Okay. You ready for Alexey to come in, Deke, for the photographs?

DMP-CM Okay. Stand by a sec here. Let's see. Got good ATS. Monitor looks okay, ...

DMP-CM Okay. ... all the cameras ready to turn on. ...

ACDR-DM Okay. ... go?

SCDR-DM Yes.

10 59 16 ACDR-DM Okay. Opening hatch 2 and Alexey should be coming in.

DMP-CM Okay.

10 59 38 DMP-CM ... turned that speaker box off.

DMP-CM Hey, Tom. ... ready ...

ACDR-DM ...

DMP-CM ... camera ... I turned them off.

ACDR-DM ...

DMP-CM ...

SCDR-DM (Ready.)

DMP-CM ..., Alexey. (Where are you?)

SCDR-CM Hello. Oh! Howdy partner. My old friend.

DMP-CM (Welcome!)

DMP-CM (To America.)

DMP-CM Here we go.

SCDR-CM Where is my place?

DMP-CM Well, for now come right into here.

SCDR-CM Okay. Back. Okay.

DMP-CM Yeah. There we go. Good show.  
 SCDR-CM Back.  
 ACDR-DM ...  
 SCDR-CM Okay.  
 DMP-CM (How do you feel?)  
 SCDR-CM Very well. How are you?  
 11 01 53 DMP-CM (All right.)  
 DMP-CM Okay. Now ...  
 SCDR-CM Back.  
 DMP-CM Okay.  
 SCDR-CM Back.  
 DMP-CM Do you think ... Flight Plan?  
 SCDR-CM Yes. Just a moment.  
 DMP-CM ... cameras ...  
 SCDR-CM Oh. This one?  
 DMP-CM That's your Flight Plan.  
 SCDR-CM Okay.  
 DMP-CM ...  
 SCDR-CM DAC 2.  
 DMP-CM Yeah, and here's the photo card.  
 DMP-CM ...  
 11 03 14 CMP-OM Houston, Apollo.  
 CC-H Go ahead, Vance.  
 CMP-OM Or rather, Soyuz. How's your view in here in the orbital module?



DMP-CM ...

CMP-OM Okay. Shortly we'll be coming on and give you a little explanation of what's in here.

DMP-CM Okay. Like to see ...

CMP-OM Hey, by the way, if you're looking, Bo, there's Valeriy's family. His wife, Lyudmila, and two children - daughter, son. Let's see, it's Kat - -

SFE-OM Katya.

CMP-OM Katya.

CMP-OM Dmitri. Yeah, that's it. The boy, the youngest, is Dmitri. Good-looking family, huh?

CMP-OM Katya is down on the shore of the Black Sea right now in a dacha having a - or in a camp - summer camp, he says.

11 04 43 CMP-OM Okay. And whenever you're ready, I think we're ready to go ahead and show you around the Soyuz a little bit.

ACDR-CM ... so let me check with ...

CMP-OM Okay. My friend, Valeriy, here is ready to show you and - please start, Valeriy.

11 05 10 SFE-OM Hello, American people. This is your Soviet/American TV center in space. That's ... onboard the docked Apollo/Soyuz spacecraft. I am going to tell you about Soyuz spacecraft. The Soyuz spacecraft consists of some compartments: the orbital module, the descent vehicle, instrument assembly unit, and propulsion system. The propulsion system has one main fuel chamber engine and two chamber backup engines. These engines are used for maneuvering in orbit and de-orbiting in the \*\*\*

SFE-OM There is orbital module - orbital module panel. You can see on your TV screens now.

SFE-OM The purpose of the panel is to control and monitor the orbital module systems. These are the following:

environmental control system, the TV and the illumination system, the radio system ... and the other - some systems. Next to this panel, there is the other one. We can use this panel for monitoring pressure integrity check or for Soyuz spacecraft in tunnel 2, and for air pressurizing and pressurizing of Soyuz and tunnel 2.

11 08 49 SFE-OM There are water systems - with the water supply and ... If one put the water supply - the water supply gun in your mouth - -

CMP-OM Yeah. If you put it in the mouth, that's the way to take a drink, huh?

SFE-OM You can drink.

11 09 47 SFE-OM There are two windows in the orbital module, the right one and the left one. One can observe the ground surfaces through these windows. We use this window for scientific experiment. There are three hatches in the orbital module. It is hatch number 4. This hatch is used for transfer from one spacecraft into the other spacecraft. This hatch was opened after docking and pressure integrity check yesterday. There is the other hatch. Here it is. We use this hatch for extravehicular activities. Welcome into Soyuz. The ... hatch is used for transfer from the descent vehicle. There are two folding desks in the orbital - -

11 11 36 SFE-OM This desk we used yesterday to sign the joint document to start our joint activities in space. Tom Stafford, Deke Slayton, Alexey Leonov, and me sit at this desk and have - and had our space talks. We - we are using this desk for our space lunch, too. Our space - spacecraft, Soyuz, has two living compartments. The second living compartment is the descent vehicle. ... the descent vehicle - - you - -

11 12 58 (Loud Whistle)

SFE-OM ...

CMP-OM Okay. We'll try a quick voice check, here.

SFE-OM ...

11 15 44 ACDR-CM Bo? ...

11 15 45 CC-H Apollo, Houston. How do you read?

ACDR-CM Bo, how do you read me?

CC-H Roger. We read you. We see you're getting ready for the tour of the command module.

SCDR-CM How do you read?

ACDR-CM Okay.

USA ...

11 16 22 CC-H Apollo, Houston. We lost communications with Valeriy. Did you do anything in the command module that may have caused that?

11 16 31 ACDR-CM Could be. What do you want me to check on panel 10? I tried to hook into the center headset, but I could - couldn't get anything. So I moved over. I'm on the right-hand seat headset now.

CC-H Understand.

ACDR-CM Hey, Vance?

CMP-OM Yeah. Hey, we checked our switches here and everything's in order, so why don't you check over there?

ACDR-CM Okay. What particular one on 10? You want VOX on that?

CMP-OM That's affirm.

(Loud squeal)

11 17 18 CC-H Tom, you've got a loud squeal now.

11 17 24 SCDR-CM Hello, American people. Hello, American people. How do you read me?

ACDR-CM There, we got rid of it then.

SCDR-CM How do you read me?

CC-H Apollo, Houston. We can't read you. We suggest you use the checklist, Apollo systems, on page 1-40.

DMP-CM ... see that page. Okay. Panel 10, Tom. MODE to VOX. ... on this one.

ACDR-CM ...

DMP-CM MODE to VOX; VOX SENSE ...; VHF FM, RECEIVE.

ACDR-CM What?

DMP-CM VHF FM, RECEIVE.

ACDR-CM ...

DMP-CM VHF - -

11 18 23 CC-H Apollo, Houston. We hear you trying to call, but you are not understandable. There is a very loud squeal coming over the comm system.

11 18 33 DMP-CM POWER, AUDIO.

ACDR-CM What?

DMP-CM POWER, AUDIO; MASTER thumbwheel to 5; INTERCOM, T/R; INTERCOM thumbwheel, full decrease.

11 18 50 DMP-CM That did it. ... - -

SCDR-CM (Moscow, this Soyuz. How do you read me?)

DMP-CM - - VHF AM, OFF?

ACDR-CM Yeah.

DMP-CM AUDIO CONTROL, BACKUP?

ACDR-CM Yeah.

DMP-CM PHONE/MIC control, ON?

ACDR-CM Yeah.

DMP-CM Okay.

11 19 08 ACDR-CM How do you read now, Bo, okay?

DMP-CM ...

ACDR-CM Okay.

DMP-CM Yeah. We had a super loud squeal. You read us okay now?

DMP-CM So have we.

ACDR-CM Does this light still stay on, here?

DMP-CM Yeah. That's supposed to be ...

ACDR-CM ...

11 19 48 SCDR-CM (Moscow, Soyuz. How do you read?)

ACDR-CM Understand. You can barely read.

SCDR-CM Houston, this is Soyuz commander. How do you read me?

11 20 05 DMP-CM Okay. Ready to tour, Tom, whenever you are.

11 20 10 ACDR-CM Okay. (Alexey. I will now show you our spacecraft, the Apollo. We are very happy to meet with you here in the Apollo. This spacecraft - -)

DMP-CM Stand by. No way I can get to it.

11 20 46 ACDR-CM How's that? How's that, Bo?

DMP-CM Oh, panel 9 VOX.

11 20 56 ACDR-CM Okay. How's that now?

ACDR-CM Okay.

ACDR-CM Okay.

11 21 20 SCDR-CM (Valeriy, how do you read me?)

SFE-OM (Very well.)

SCDR-CM (Do you have comm with Moscow?)

ACDR-CM How's that, Bo?

CMP-OM Which cable are you on, Tom?

SCDR-CM (No, huh?)

ACDR-CM Say again.

DMP-CM He wants to know what portable cable - -

ACDR-CM Okay. You want to continue on, Bo?

11 21 50 CMP-OM (How - -)

ACDR-CM (The Apollo, this is - -)

CMP-OM (- - not)

ACDR-CM (The Apollo is the spacecraft aboard which the astronauts have flown to the Moon and also to our space station Skylab.)

11 22 08 SFE-OM (Wait just a minute, it's early.)

11 22 11 SFE-OM (Yes.)

SCDR-CM (Early, isn't it?)

ACDR-CM (This is the orientation indicator. This is the main indicator for our operations, and this is the backup indicator.)

11 22 30 ACDR-CM Bo, can you see ... the front?

ACDR-CM Roger. (Here is the computer. The role of the computer aboard the Apollo is a very important one. The computer makes it possible for us to tell the distance between the Soyuz or other vehicles - spacecraft in space. If I want to know our exact orbit, I can interrogate the computer. For an example: if I want to know the height of our orbit, I can ask the computer.)

CC-M (Everything is heard well.)

SFE-OM (Roger.)

ACDR-CM (Now, the - a computer is thinking after I ask it - it's thinking what to - how to respond. And now you can see our apogee of 124 miles by 121 miles. Then, here, you can see our perigee and apogee.)

SCDR-CM ... computer.

11 24 15 SCDR-CM (We will begin or not?)

SFE-OM (Okay.)

SCDR-CM (Moscow, this is Soyuz. How do you read?)

CC-M (Soyuz, Moscow - - )

SCDR-CM (I read you well. When are we having a TV session - from the Apollo?)

DMP-CM Picture looks good here, Tom.

11 24 37 ACDR-CM Okay.

11 24 39 CC-M (Then let's ...)

ACDR-CM Okay. You seeing this down there, Bo?

11 24 41 SCDR-CM (I don't see the light of the ...)

SCDR-CM (You have a picture, don't you?)

ACDR-CM Okay. Good.

USSR ...

SCDR-CM Okay.

CMP-OM (Yes.) Uh-huh.

ACDR-CM (- - sextant and telescope.)

SFE-OM (...)

SCDR-CM Okay,

SFE-OM (...)

11 25 40 SCDR-CM (Now we have the second day of our flight. We finished the second transfer. Vance Brand is with Valeriy Kubasov onboard the orbit spacecraft and I am in the Apollo with Tom Stafford and with Deke Slayton.) Tom, come here. (Tom Stafford. You know the American astronaut who's made three space flights. You know him. And now his fourth flight. Deke Slayton is sitting to the right. He is an old space veteran but this is his first flight into space. Now I am asking Tom Stafford.)

SCDR-CM Tom may start! Okay.

ACDR-CM (Soviet TV viewers. I am very happy to meet with Valeriy and Alexey here in space.)

11 26 43 SFE-OM (Repeat ...)

CMP-OM (Yes. After him.)

ACDR-CM (Here we have our onboard computer and if I ask our computer what our apogee and perigee are, the computer will think about how to respond. Now you can see 122 miles by 121 miles. A very smart computer. And this is the second important workplace for the crew.)

SCDR-CM Tom, which Apollo system is the heart of the spacecraft? (I asked, "Which - which system is the heart of the spacecraft?")

ACDR-CM (The heart of the spacecraft is the computer and the inertial gyro platform.)

SCDR-CM Okay.

ACDR-CM (And also the fuel cells. Fuel cell is the power - electrical power source.)



SFE-OM (Hour 1.)

ACDR-CM (And here we have number of switches.)

CMP-OM Oh - -

SCDR-CM Tom, please, come here.

ACDR-CM Okay.

SCDR-CM Put it here. Okay.

ACDR-CM (Here - this is the second important place for the Apollo crew. Here, we have the telescope and the sextant. We observe - we look at the stars through the telescope and determine our orientation. Also, during the approach to the Soyuz, we looked at the Soyuz through the telescope.)

SCDR-CM Tom, do all Apollo spacecraft systems have primary and backup modes? (I asked, "Do all these systems of the Apollo spacecraft have the primary and emergency backup modes?")

11 29 16 ACDR-CM (Yes. All its systems have the primary and backup modes. For example, this is the main indicator, and here's the backup indicator. We have a main and also a backup inertial plat - gyro platform. Here, we have a fuel cell plus a battery.)

SCDR-CM Tom, does it take much time to learn to operate all spacecraft systems? (I asked, "Did it take a long time to learn how to operate all these systems?")

ACDR-CM (Yes, it does take a long time, Alexey. I think about a year - a year's work - should take a year before the astronauts know all the systems.)

SCDR-CM Where do you sleep here? What is this?

ACDR-CM (Here is the place where I sleep. This is the Apollo commander's place. You know who the Apollo commander is?)

SCDR-CM I know. Tom Sta - (laughter).

11 30 34 SCDR-CM (Dear viewers, with this, we are ending our short TV coverage. I think we'll meet again in space at least once, or more. And, certainly, we'll see each other on Earth after we return - after we all return, each of us to his own homeland - in the Soviet Union and in the United States of America. Thank you, Tom. Thank you very much.)

ACDR-CM (Here we have a small kitchen aboard - -)

ACDR-CM (- - there is very little room here but, after all, nobody has to do any dishes.) (Laughter)

CMP-DV Okay, Bo. How are you reading us down in Soyuz, now?

SCDR-CM ...

CMP-DV Okay.

SCDR-CM ... report ...

ACDR-CM (Which report?)

SCDR-CM - - Beautiful.

ACDR-CM (All right.)

SCDR-CM ... very small time!

11 31 38 CMP-DV Okay. Valeriy and I are down in the descent vehicle, the part of the Soyuz that is really the control center and the part that comes down for landing. And Valeriy's on the - in the right seat - (flight) engineer's seat - about ready to give you a first few words. But first, I'd like you to make sure that we have communications with Valeriy now. We lost him a little while ago.

DMP-CM Tangled in cables.

SFE-DV How do you read me?

CMP-DV (All right, Valeriy.)

11 32 24 SFE-DV Okay! We are in the descent vehicle now. The crew control center - monitors the operation of the spacecraft main systems from the descent vehicle. There

is an instrument board. Here it is. You can see it on your TV screens now. I - I would like to illustrate the purpose of this panel to you.

DMP-CM Try to get it stowed, for now, is all.

SFE-DV So-called globe instrument. Shows automatically the - point of the Earth our spacecraft is flying over at this moment. In front of me - in front of me, there is a - -

11 33 24 SCDR-CM ...

SFE-DV - - there the other panel. It shows us how the system is operating - now. This panel has the caution and warning displays. There is one more unit - here. Here it is. We can send digital data - use this panel in automatic systems. Here are two command signal devices, the right one and the left one. We can send about 380 code - -

DMP-CM ... where we can find it.

SFE-DV - - functions to control the spacecraft. You can see the two couches now. The left one is - Soyuz commander, and the right one is mine. Vance is now in - Soyuz commander couch. We take these seats during landing and lifting off. At this time, we have a pressure garment assembly on. Now the PGAs are in the orbital module. There are two controllers. The left one - left one. Oh. (Laughter) Left one!

11 35 35 CMP-DV Pretty hard to see.

SFE-DV Uh-huh. Left one - is used to - for orientation maneuvering relative to center of gravity. The right one - is used to translate the spacecraft center of gravity - relative the orbit and change the spacecraft orbit. The descent vehicle has two windows and a special lighting device - special light - -

11 36 30 SFE-DV Generally speaking, the descent vehicle has more equipment than the orbital module. That's why you - we prefer spend our free time in the orbital module. And, Vance, would you - would you like to say - how - do you like the Soyuz spacecraft?

CMP-DV Of course, Valeriy. I wouldn't be in here right now if I didn't enjoy coming in and looking around and - Looks to us like it'd be a good air - -

ACDR-CM ... go ahead and I finish. Get that out.

CMP-DV - - a good spacecraft to be flying in. We've really enjoyed your tour here. Okay - -

DMP-CM Okay. Then I can - -

CMP-DV - - Valeriy says - Valeriy says that will be the end of his tour down here. It's a real interesting place down here; first time I've had a chance to be here in flight. And I guess we'll turn it back to you now, Bo.

SCDR-CM (We'll be finishing our daily session.)

SCDR-CM Okay.

CMP-DV Right.

SCDR-CM (What time do we finish the session? Tell us.)

DMP-CM Go ahead, Bo.

SFE-DV ... with our modules ...

11 37 59 DMP-CM Okay. Stand by, ...

SFE-DV ... (Let's start to give ...)

11 38 14 SFE-DV (Continuation of familiarization.)

SCDR-CM (Roger. Let's go right now.)

CMP-DV Yeah, Tom. ... good old ...

SCDR-CM Tom, here ...

11 39 59 SFE-OM (Do you have any estimate - - )

ACDR-CM (All right.)

SFE-OM Okay. (... We have a picture.)

11 40 18 SFE-OM (We have the American TV camera here. Good evening, comrade TV viewers. We are on the - onboard of the spacecraft. Onboard we have - Leonov is now in the Apollo, and here we have Vance Brand. In Soyuz with Brand; we are in the orbital module of the Soyuz spacecraft. We have just had two TV sessions for the American people in regard to the - about the Soyuz spacecraft vehicle and now we want to tell you about our program and also tell you somewhat about our spacecraft. Yesterday at 4 o'clock, we completed the first transfer. And here we have our TV session where there were a lot of movies made and a lot of still pictures. And also we exchanged - we will have to exchange souvenirs, and also we are scheduled to perform a number of joint experiments. As you see, the program is very tight. Here in the orbital module, we have everything that is necessary for us to work comfortably.)

SFE-OM (How is it now?)

SFE-OM (We just put the light in a different place.)

SFE-OM (Here in the orbital module, we have many different lights; the light which we use for picture taking, for television, and for movie photography. Our TV session is coming to a close, so with this, we will say goodbye to you, our dear comrade TV viewers; and the best of everything. Goodby.)

DMP-CM Okay.

11 44 12 DMP-CM Well, I'll tell you, ... there's no way to get that switch in ...

DMP-CM See the problem, right there? Anyway - -

SCDR-CM ...

SCDR-CM (Laughter)

SCDR-CM DAC.

DMP-CM ...

DMP-CM Yeah.

11 46 32 SCDR-CM I need - I need your DAC.

DMP-CM Oh. Sure do.  
 SCDR-CM Where is film - film for DAC?  
 DMP-CM Okay. Let's see. ... 119 ...  
 ACDR-CM ...  
 SCDR-CM ... up there, okay?  
 ACDR-CM ... get the camera ... get ...  
 SCDR-CM Okay.  
 SCDR-CM DAC 1, DAC 2 - DAC 1 (yes)?  
 DMP-CM DAC 2 ... No DAC 2. Okay.  
 SCDR-CM ...  
 11 47 28 DMP-CM Wait a minute. DAC 2 is - C-110.  
 SCDR-CM ...  
 DMP-CM ... LEB.  
 DMP-CM ... Yeah.  
 SCDR-CM C-110 ... Okay. Oh, pardon me. I can do it. Thank  
 you.  
 DMP-CM ...  
 SCDR-CM Just a moment. Tom. Put it in DAC.  
 ACDR-CM Yeah.  
 SCDR-CM ... DAC 1.  
 SCDR-CM Okay. Thank you.  
 11 48 59 DMP-CM If you're ready, - -  
 SCDR-CM DAC.  
 DMP-CM - - if you're ready, I'll turn it on. Okay.  
 DMP-CM Okay. ...

DMP-CM Okay, whenever you guys are ...

ACDR-CM Yeah.

11 49 53 DMP-CM Well, I can ... .. You have to handhold it to  
get ...

ACDR-CM ...

DMP-CM I ... the wide-angle lens. I don't think ...

DMP-CM Yeah, well. We're supposed to be getting right there  
looking at waves ...

11 50 46 DMP-CM Let's see, you've got the DAC. Okay. If you guys  
are ready now, ... turn on the camera.

DMP-CM Okay. It's on. ...

11 51 09 SCDR-CM Okay. Can you make ...

DMP-CM Yeah.

DMP-CM Hey, it looks pretty from over here. ...

ACDR-CM There we go.

SCDR-CM Okay. Stop.

11 51 41 DMP-CM Good show.

ACDR-CM ...

DMP-CM ... Okay, there ...

ACDR-CM Okay. ... turned on here. Okay?

SCDR-CM Okay.

ACDR-CM Okay.

DMP-CM Alexey.

11 52 32 DMP-CM We've got the switch up there ... Right. ...

DMP-CM Okay. Go ahead. I'll just ... over that. Hell,  
that ...

DMP-CM Ready?

SCDR-CM Yes. We are ready.

DMP-CM ...

11 55 08 DMP-CM We're going to run out of film here ...

DMP-CM Okay. ...

DMP-CM Yeah. ...

DMP-CM Okay.

DMP-CM ...

11 59 07 DMP-CM Okay. Let's see here.

DMP-CM Okay. Coming up on ... here.

DMP-CM ... Okay. I'm - We're going to make some ... Earth obs.

11 59 36 DMP-CM ... Okay. ... Pass DAC over ... the old DAC here. Now the next ... DAC. ... DAC. ... Okay. Oh, I know what he wanted me to do ... get pictures ... DAC.

SCDR-CM DAC 1 ..., I'm okay?

DMP-CM Right.

SCDR-CM You want to help me?

DMP-CM Okay.

SCDR-CM ...

12 00 58 DMP-CM ... give it to you, Tom.

12 08 17 CC-H Roger.

ACDR-CM Yeah. It looks like we're right on the time line today.

CC-H Very good.



12 08 55 ACDR-CM (Soyuz this is Apollo. ...)

CC-H Apollo, Houston. We'd like to remind you not to PRO  
until 72:05.

DMP-CM (Very good.)

12 09 10 ACDR-CM Roger. Roger. We'll do that. What about ... point-  
ing to the right ... be sure I'm ... how long you  
were ...

CMP-OM Okay. Good.

USA ...

CMP-OM ...

ACDR-CM ...

ACDR-CM ... right around here.

12 16 16 USSR It's around the - the ...

USA (What did you say?)

SCDR-CM Valeriy? Valeriy?

SFE-OM (Yes.)

SCDR-CM (Look into the window, right now. It is so interest-  
ing There is such a wonderful band of different ...  
around the Earth.)

12 24 49 CC-H Apollo, Houston through ATS. How do you read?

ACDR-CM Bo, read you loud and clear. We're about ready to  
proceed in 10 seconds on that P20.

12 25 00 CC-H Roger. Understand.

# TIME SKIP

12 47 08 ACDR-CM ... the checklist calls it at 8. Do you want it  
up or down?

CC-H I'll check with INCO.

CC-H Tom, we'd like you to leave the VOX at 5.

ACDR-CM Okay.

CMP-OM Will the - -

12 47 34 ACDR-CM VHF FM thumb - thumbwheel is 5 ...

CMP-OM ... (We're doing that.)

ACDR-CM The S BAND's at - -

CMP-OM (We're doing this later. Right?)

ACDR-CM - - S BAND thumbwheel is not full decrease. ...

CMP-OM We've - we've ...

12 48 09 ACDR-CM How do you read, Bo?

CC-H Go ahead. We read you, but you have a background noise.

ACDR-CM Yeah, any time that I get the S BAND thumbwheel out of full decrease, it goes.

12 48 31 ACDR-CM And the POWER is at AUDIO, the MASTER is 5, like the checklist. The INTERCOM is T/R, INTERCOM thumbwheel is full decrease. VHF AM is OFF. AUDIO CONTROL panel is BACKUP. And the PHONE/MIC CONNECT is ON.

12 49 22 ACDR-CM ...

ACDR-CM Okay.

ACDR-CM Okay. Did you read Alexey?

ACDR-CM Okay. Vance, have Valeriy give Houston a call.

ACDR-CM ...

CMP-OM Okay. Valeriy - Valeriy was just speaking to you. Let's try it again.

SFE-OM Houston, Houston. This is Soyuz. How do you read me? How do you read me?

12 51 29 SCDR-CM Houston, this is Soyuz commander. How do you read me?

SFE-OM Apollo, Apollo. This is Soyuz. How do you read me?

SCDR-CM Apollo, I read you loud and clear. Soyuz -

SFE-OM (Alexey, how do you read me?)

SCDR-CM (I read you excellently. I hear you excellently, Valeriy.)

SFE-OM (Where are we flying now? Over what?)

SCDR-CM (Well, take a look at the gyro. It's easiest to tell.)

SFE-OM (I'm now in the orbital module. So go down and take a look at the globe.)

12 52 16 CMP-OM Houston, Soyuz.

SFE-OM (This is the Mediterranean.)

CMP-OM Okay. We're coming up over the Mediterranean Sea now. Just left North - North Africa, and I assume you'll be ready to carry some words from Valeriy on - looking down on the Soviet Union, shortly. Is that correct?

CMP-OM Okay.

12 52 52 SFE-OM (We've just passed over Africa, and we're now over the Mediterranean.)

CMP-OM Oh.

DMP-CM I'll get the Flight Plan here and ... Okay ... would be - Okay. About 30. You got a - yeah - yeah, okay. I better move.

ACDR-CM Hey, Alexey. ...

SFE-OM (Moscow, this is Soyuz 2. How do you read me? Over.)

DMP-CM I thought the last one was supposed to be ... You think so?

12 53 58 SFE-OM (Moscow, this is Soyuz 2. How do you read me? Over.)

ACDR-CM ...

SFE-OM (Moscow this is Soyuz 2.)

ACDR-CM ...

12 54 16 SFE-OM (I also hear you well. We're now in the orbital module, near the porthole, and - getting ready for the TV coverage. That's why you are not seeing us well.)

DMP-CM ...

SFE-OM Much better.

ACDR-CM Okay.

SFE-OM (On the TA-3 bracket.)

SFE-OM (Yes. It's not on TA-3.)

SFE-OM (We're trying to have it handheld.)

CMP-OM Okay, Bo. I think that we're about ready to go here. Looks like we're coming up over the Black Sea, and right now Valeriy is getting in position. Got a little bit of spaghetti in the cabin here; various cables and cords. He's ready to tell you a little about his homeland here, the Soviet Union, a very big country. Okay, Valeriy. Please go ahead.

SFE-OM I see my airfield where I flew 10 years ago in Graberin. (Laughter.)

12 56 16 SFE-OM Dear American TV people, you ... about the Soviet Union. Some of you visited my country and you enjoyed the beautiful people, cities, and towns, rivers, forests, mountains, and fields. Alexey Leonov and me visited the United States several times, and we did enjoy its beautiful landscapes. (Moscow. Answer.)

CMP-OM Are you reading, Bo?

CC-H ...

SFE-OM Roger. It would be wrong to ask which country's more beautiful. It would be right to say there is nothing more beautiful than our blue planet. You will enjoy the sight of it together with us, and we shall help you, explaining what flows below the spacecraft. We are going to tell you about a little part of our country, which you will see on your TV screens. Our spacecraft, Soyuz, is approaching the U.S.S.R. territory. Our country occupies one-sixth of the Earth's surface. Its population is over 250 million people. It consists of the fifteen Union Republics. The biggest of them is the Russian Federal Republic with the population of 135 million people. ...

SCDR-CM Valeriy, please. Tell our people about ...

SFE-OM (Alexey. Where are we flying now?)

SCDR-CM (Past the Volga.)

SFE-OM (Volgograd.)

SCDR-CM (Oh, we passed Volgograd.) (Just passed the Volga.)

12 58 58 SFE-OM We are approaching the Volga River now. This river is the biggest in the universe. At the moment, we are flying over the place where the Volgograd City is. It was called Stalingrad before. In winter 1942-1943, German fascist troops were defeated by the Soviet army here. 330 000 German soldiers and officers were killed and taken prisoner here. (Moscow, this is Soyuz 2.)

SFE-OM (Okay.)

SFE-OM (I won't have time to finish it in 3 minutes.)

SCDR-CM (Moscow, Moscow, this is Soyuz. How do you read?)

SCDR-CM (I read you excellently. I am now in the command module of the Apollo spacecraft. I am here together with Deke Slayton and Tom Stafford. We are flying over the Soviet Union's territory, and we are observing everything which is speeding by below us. We began our observations over the Crimean peninsula and now we're approaching the Ural Mountain range. It's a beautiful Earth below us; blue, covered with slight cloud. The ... is visible today.)

SCDR-CM (On the line.)

SCDR-CM (It looks like today's a very beautiful day on - over the entire territory of the Soviet Union. There's a lot of sunshine everywhere - Earth. Green fields - -)

SCDR-CM Okay.

13 01 39 CMP-OM Houston, Soyuz. Okay. I guess Valeriy's finished, and you got a word - a few words at the end there from Alexey, talking to his people on the ground. It's a very long tour over the Soviet Union. We're still passing over it. The eastern part here is steppe, or desert, and there's just a lot of country here - lot of farmland down here on the - on the steppes, apparently. I think very shortly we'll be at the Pacific, and here - here's some more words from Valeriy.

SFE-OM - - of April 1961. From that time, we celebrated the 12th - the 12th of April every year as a Cosmonaut Day.

SCDR-CM (Valeriy, ...)

SFE-OM Our spacecraft was launched from here, too.

SCDR-CM By the way, 3 years ago - 3 days before, Valeriy Kubasov and me was launched from this Baykonur launch pad.

13 03 22 SFE-OM We are going to land here after the end of the mission. This part of Kazakhstan was not cultivated until 15 years ago. Today, it is one of our bread-baskets. A new city, Kaliningrad, was - Kaliningrad appeared here. It was only 10 years ago. Not far from here begins the Siberia, the biggest part of our country, rich in natural resources.

CMP-OM We're over the mountain ... clouds down here.

SCDR-CM We are over mountains now.

13 04 48 CMP-OM Okay. Go ahead.

3  
C  
CMP-OM Okay. ... clouds. Okay. Apparently - yeah, it's a little hard to see the ground now. Valeriy's still looking at the clouds here sort of covering the view.

SFE-OM (Monitoring pressure integrity. Everything's normal.)

CMP-OM Go ahead.

SFE-OM (Did you ...)

13 05 40 CMP-OM As you see, we have a stable situation here.

13 23 21 CC-H ... minute to LOS. ATS - -

CMP-OM Next; minimum.

CC-H - - 3:38.

DMP-DM Roger.

13 23 53 CMP-OM ... Mainly the in between axis, and ... should be ...

CMP-OM And that's a repeat of the middle. ... it is ... on 6.

13 25 07 SFE-OM (... installation of ... by the American astronaut ... in the orbital module. I would like to demonstrate to you one simple experiment on rotation of a body relative to the various axes. As is known, rotation ... stable relative to the axes of inertia to the maximum moments of inertia and to the minimum moments of inertia. And as far as the central moment ... goes, the rotation ... unstable. Well, we want to show that during this experiment because it is rather difficult to perform such an experiment on Earth we ... Now I am going to show you rotation relative to ... moment of inertia ... it will be unstable. You will see how the rotation ... how the body will start tumbling. This was unstable rotation. Now I will show you the stable rotation relative to the maximum moment of inertia. ... astronauts. ... It's very quietly spinning without any tumbling. ...)

SFE-OM ...

13 28 09 CMP-OM Okay. We have demonstrations. Okay, this is a - just a simple gyro. And we want to demonstrate a simple but important property of a gyro. The - the - that's right. Valeriy's right. Every spacecraft has to have gyros. Stand by.

ACDR-DM ... goes too, which - -

CMP-OM You can see it. It's - this gyro is not spinning, but you can - -

ACDR-DM - - get the other bag.

CMP-OM - - hit it, and it will just tumble like any object. Now I'll spin it up.

13 29 20 CMP-OM Okay. Now we have it spinning. I'll knock on it with a pencil, and we'll see what happens.

ACDR-DM ...

CMP-OM Okay, you can see that basically it doesn't like to be moved, but that motion of - -

ACDR-DM ...

CMP-OM - - a gyro is 90 degrees from the direction of the force applied to it.

13 30 09 CMP-OM So. Very interesting. The very well-known property of a gyro is a tendency to freak out [?]. And ... Now we'll let Valeriy give it a try.

13 30 40 SFE-OM (... you understand about the gyroscope. ... power ... of the gyro ... preserves direction. Here, if this body is a gyroscope ... ... then it is not a gyroscope. It will be gyroscope when it rotates relative to its axes. So now it is quietly moving, rotating, from the smallest touch. If we set it to a twisting motion, then you will see that the touch won't do it. It will still maintain its direction in space, but if touched, it will progress in the direction of the ... moment. Now I will show you. Here, I set it to spin, and now I got the gyroscope. ... It preserves the direction of its axes in space. Now I will try to ... it. Look. It will only ... it does not change the direction of the rotation



axis. Well, such gyroscopes are in each rocket, in each spacecraft.)

SFE-OM (Okay. One moment, Vadim, the gyroscope began to move. I will demonstrate it one more time. It's moving away from me; it can be in a rightward motion.)

SFE-OM (... of the gyroscope is called ... It is used in particular in space technology for integrating accelerations.)

13 34 22 CMP-OM Okay. What's the next thing - next - that we demonstrate? We have two metal balls with a connecting stick, which - You might imagine these two balls a double ..., for example, in space.  
(Laughter) ... of the gyro.

ACDR-DM ... you got time for another one ...

CMP-OM Okay. The important thing is what happens - or the interesting thing is what happens when we rotate the two balls.

13 35 09 CMP-OM Okay. You can see that they rotate about a center. It's - in between the two. The - it's balls of the same mass, so therefore the eye of rotation is - -

ACDR-DM ...

CMP-OM - - directly in between the - Even when I tried to rotate about one - the balls - turns out that they still rotate about the center of the mass. Okay, let's take another example. Let's take off one of the balls and replace it by a larger.

13 36 10 CMP-OM Okay. Now we have a large, white ball, large mass and a - let's see, a small - -

ACDR-DM ... come over here.

CMP-OM - - orangish-red ball. This is analogous to the Earth and the Moon. The Earth has about 80 times the mass of the Moon. And when you have unequal masses, if the center rotation's not at the center, if it's not directly in between the - the halfway point, in the case of the Earth-Moon system, the - the whole system rotates to the point slightly under the Earth's surface about a quarter of the way down

toward the center. Now, let's rotate this and see where the center of rotation is.

13 37 02 CMP-OM As you can see, it's essentially about the white ball on - about a point just under the surface of the white ball. And this is analogous to the Earth-Moon system, as I said before.

13 37 35 CMP-OM Okay. Valeriy, would you like to give it a try?

13 37 56 SFE-OM (I would like to demonstrate to you rotation ... about the center of gravity. The body will always rotate relative to the axis which passes through the center of gravity, but in this case the center of gravity does not lie in the center of this ... but nearer to the large white ball. ... you will see how the body rotates and this we will now demonstrate. In this system, the center of gravity will pass right through the center and this ... when rotating. You see how it's rotating. See, not at all like in the other system.)

13 41 32 ACDR-CM Okay. The water's off and the lights are out.

13 51 28 ACDR-CM Okay, Vance; Tom.

CMP-OM Go ahead.

SFE-OM Go ahead.

ACDR-CM Okay. Is Alexey's food - put out separately or with special designation on it? Do you remember?

ACDR-CM Yeah, I read you.

CMP-OM Okay.

ACDR-CM Okay.

13 52 11 CMP-CM The one on the right.

ACDR-CM Okay.

13 52 26 ACDR-CM Okay.

14 06 40 ACDR-CM Roger. ...  
ACDR-CM Okay.  
ACDR-CM Okay, I got those two; and that's at 76:40 something.  
Right?  
14 07 40 ACDR-CM Will do. Be glad to.  
ACDR-CM Oh, Bo, one thing. On the furnace shutdown, it's  
still too hot on that sample. We don't have the  
cool light yet.  
ACDR-CM Okay.  
14 09 00 ACDR-CM Okay. I told Alexey about the pass at Quito. We're  
all squared away.  
14 11 11 ACDR-CM Go ahead.  
ACDR-CM Okay.  
14 13 49 ACDR-CM Okay, Bo. TV POWER is ON there for you.  
ACDR-CM Stand by. It's kind of hard to move around here.  
ACDR-CM Okay, Bo. I guess you want the center window shade  
up. Probably the worst one would be the left one.  
14 16 49 ACDR-CM How's that, Bo?  
ACDR-CM Okay. I got the center hatch window.  
14 17 34 ACDR-CM Right now, we're preparing the meal and putting hot  
and cold water with the food items.  
ACDR-CM And now, we - ...  
ACDR-CM Okay.  
14 18 18 ACDR-CM Okay, Bo. It's going to AVERAGE right now.  
ACDR-CM Yeah.

ACDR-CM Okay. I can see you're getting some bright spots in there. I can't tell where they're coming from.

SFE-OM (Moscow, Soyuz. ...)

14 19 07 SCDR-CM I read you. (...)

14 25 44 ACDR-CM Okay. Alexey says he doesn't have comm with Moscow.

SCDR-CM (Moscow, Soyuz. How do you read?)

CMP-OM ... to this.

14 26 11 ACDR-CM Stand by.

ACDR-CM How's that? -

SCDR-CM (We're ready.)

SFE-OM (Moscow, Soyuz. ... Vance Brand.)

ACDR-CM Okay.

14 27 24 SFE-OM (Moscow, Soyuz 2. We can begin to introduce our friends the first time we find ourselves with the Americans. Dear TV viewers, I am now with Vance Brand in the orbital module. I would like to ask him to say a few words.) Vance, say some words for the Russian people, please.

14 27 52 CMP-OM (Hello. Okay. Good day. I'm very happy to be here. This is my first time in orbit, and we have found very good hospitality here aboard the Soyuz. Soon, we shall eat, and I think that I very much would like to try to taste this food. It can be said that our project here are - is a very important one, and, as you know, everything is proceeding according to program. I think that everything is going very well. Of course, we are friends; we understand each other very well. And I think that soon we'll have dinner. I think we'll soon have dinner. Thank you.)

14 29 28 SFE-OM I want to ask one more question first. How do you like to fly in Soyuz spacecraft?

CMP-OM (Of course, Soyuz is a good spacecraft. It's very good here, very comfortable.)

14 29 47 SFE-OM Thank you very much. (Now, we will continue our TV coverage. Our joint activities with Vance Brand, who is visiting here, will soon come to an end, for this joint activity began at 4 hours at Sun - very little is left. The only procedure that we have left to do is our joint dinner. We have conducted all of our joint experiments, all our joint tasks. We have held several TV coverage sessions about the flight, and now the concluding stage of our joint stay here is approaching. To Vance, for you to remember your stay here, I would like to present to you from the Soviet - the Russian people - a medal of the Soyuz and Apollo. Now, you would - you can be able to see it on your screens. The same kind of medal was presented yesterday to Stafford and Deke Slayton - yesterday. And today, I am presenting this medal to Vance Brand.)

14 31 19 CMP-OM (That's wonderful. Thank you very much.)

SFE-OM It is a gold medal from Russian people to you.

CMP-OM (This is the emblem of the Apollo-Soyuz, yes?)

SFE-OM Apollo-Soyuz Test Project.

CMP-OM (The Apollo-Soyuz.)

14 31 45 SFE-OM (Now we are beginning the - really, we are beginning the final - the conclusion portion of our joint activities here in the Soyuz spacecraft before - No, because soon both of you - both of us will go into the Apollo. We are now beginning our space dinner because we have worked a great deal of time already, and we need some sustenance. Space dinner, as you know - There's some background noise here. There's some interference, I don't understand what it is.)

SFE-OM (Space food consists of several courses. I can't even hear myself. There's some interference here.)

SFE-OM (Moscow, this is Soyuz 2. How do you read? Over.)

SFE-OM (... interference. Moscow, this is Soyuz 2. How do you read? Over.)

CC-M (I hear you normally.)

SFE-OM (Moscow, this is Soyuz 2. How do you read? Over.)

CC-M (We read you. Let go of your intercom button.)

SFE-OM (Roger. We had some interference. How is the picture right now?)

SFE-OM (... Our space food consists of several courses: For the first course today is shchi with sauerkraut, a green shchi. Vance likes green shchi; and for me, shchi with sauerkraut. Second course we have meat, chicken with egg; for the third course, we have juices, black currant juice with sugar. We have coffee. Here we have black plums - plums and strawberries. Here we have everything that is necessary in order to prepare this food. On my right, here is our unique - kitchen. It's an electric kitchen, very comfortable and convenient to use. And I think that our house - housewife at home might be envious of such a kitchen. If I can call this a first course, it's right here. It's already heated. This is a tube which contains the food inside, and I've placed it inside and now am heating it. I would like to ask Vance how he likes our space food.)

14 34 58 CMP-OM (Yes, very much. I like, especially, your bread, the meat, and also the shchi - the soup. I think that Russian food is basically similar to American food. There is not too much of a difference.)

ACDR-CM Hello, Houston, Apollo.

SFE-OM (And this evening we're scheduled to be in your spacecraft, so we'll try your food.)

CMP-OM (Okay.)

14 35 43 ACDR-CM Hello, Houston; Apollo.

CC-H ...

ACDR-CM Roger. You want Alexey to give a commentary about food here?

CC-H Roger. ...

SCDR-CM (Yes.)

ACDR-CM (Are you ready?)

SCDR-CM (Soyuz 1 is ready.)

14 36 34 ACDR-CM Okay. We're up here now on our lunch. In fact, Deke has prepared most of it, since he's in that part of the spacecraft. Alexey's here in the center getting ready to eat. We'll have Alexey say a few words to you.

SFE-OM (Transfer is being carried out.)

SFE-OM (I heard.)

ACDR-CM Are you reading Alexey? Soyuz, are you reading Alexey?

SFE-OM (Where is this to be plugged in? To which connector? But I don't have the TV camera 3. It's in the Apollo now.)

ACDR-CM Okay. They're not - Alexey is eating some steak, some beefsteak.

SFE-OM (I'm writing, I'm writing.)

14 38 13 ACDR-CM It's - Looks like it's barbecued, even - like it's roasted on a grill, but it's in a pack that preserves it.

SCDR-CM (Sit down.)

SFE-OM (... Right now 347/10 is on 347/10-1.)

14 38 57 ACDR-CM Have you been reading Alexey before, Houston?

SCDR-CM ...

ACDR-CM Okay. I think that's switched over to Soyuz is what - Hey, Vance, would you tell Valeriy to set Alexey up so he can talk into Houston?

14 39 26 ACDR-CM While they're taking care of that, Alexey's continuing to eat his beefsteak. He also has strawberries, almonds - -

SFE-OM (... how do you read? Over.)

SCDR-CM Valeriy ...

SFE-OM (Alexey, how do you read? Over.)

SCDR-CM Valeriy ...

SFE-OM (... Over.)

CMP-OM Tell you what, Bo. If - if you want, while we're getting the comm squared away, we can talk a little about our food over here.

ACDR-CM Also - Hey, Vance, tell Valeriy that Alexey reads him and the rest of us loud and clear, but he can't transmit.

14 40 36 CMP-OM Okay, Bo. Well, let's press on.

SFE-OM (So, in the third - in the third - transfer, you don't have to do TV coverage 11.1 from the docking module. This is what Moscow said. Your TV - 11.1 TV session is canceled. Did you copy?)

14 41 06 CMP-OM Okay, Bo. We'll start on the meal here, if you're - if you're all set. I think you can see - I think you can see that Valeriy has spread out a meal for us on the table. We have a little collapsible table here on Soyuz, and right now it's covered with food that's under little rubberband-type devices, such that it won't float away. Most of the food comes either in tubes, such as what you see here, or in cans - like a tuna can - or just in packages - cellophane packages. The - -

SFE-OM (Yes.)

14 41 52 CMP-OM (Yes.) (Laughter) There is an example of something in a cellophane package. It's bread. Now, also, there's a heater for heating up these tubes. The heater's over here on the wall. Don't know if you can quite see it. It's - anyhow, it's an electric



heater. And Valeriy, just a short time ago, put two tubes of soup in there and heated them up for us. It didn't take long for them to heat up, and so now Valeriy has just opened up one of those tubes, and he's trying a little of this soup. This is called shchi, a very common and delicious soup. Incidentally, the foods over there in the Soviet Union are somewhat similar to ours. Naturally, some dishes that are different. In general, I like things like their ice cream, bread, shish kebab, things like that. Here on the table, Valeriy seems to like his shchi very well. I think some of the best space foods are these canned meats like we have here, chicken with eggs; chicken, also tuna, various fishes are very good.

ACDR-CM (...)

14 43 39 CMP-OM Okay. We have napkins - -

SCDR-CM (Valeriy, how do you read me?)

SFE-OM (Weak.)

SCDR-CM Valeriy, how do you read me?

SFE-OM (I read you very weak.)

SCDR-CM (Valeriy, I have no comm with Moscow at all. I just changed my headphones, and I'm now speaking from Deke's place. I did not do my TV coverage of space food. The way I understood you is not to do the TV seance from the docking module. 1.)

SFE-OM (2. When you come in here, take with you - take 4 cartridges with you. Did you understand?)

SCDR-CM (Roger. Over.)

14 44 39 CMP-OM Okay. So anyway, Bo, we're about to start eating, and we'll eat with knives and forks and spoons, just the way you would down on the Earth. Most of the food will stick to the spoon well enough, and things that won't, of course, will be eaten out of the tubes, or, like the bread, will be eaten in bite-sized bits. All in all, it's a very convenient setup up here. With that, unless you have any questions, I think we'll press on and eat.

14 45 28 ACDR-CM Okay, Bo. If you look on TV, you see Alexey eating some soup. In fact, it's potato soup.

ACDR-CM How's the soup, Alexey?

SCDR-CM Okay.

14 46 08 ACDR-CM All righty. You want it off now, right?

15 01 10 CC-H Apollo, Houston through Wa - Wallops for approximately 5 minutes.

15 01 15 ACDR-DM Roger. Through Wallops.

15 04 57 CC-H 1 minute until LOS. Next AOS is Santiago at 75:10.

15 05 44 ACDR-DM What? Yeah, what?

#### TIME SKIP

15 26 08 CMP-OM Tom, how do you read? How do you read, Tom?

ACDR-DM I read you, Vance. Vance, how do you read?

CMP-OM Okay. How's the transfer going?

ACDR-DM Okay. We're getting ready ... It's been a little slow here. ... did the relay come from Houston?

CMP-OM No, haven't heard - heard them, lately.

ACDR-DM Okay. I wonder about this furnace shutdown here.

DMP-CM Okay. I think you're supposed to go on schedule, Tom, ...

ACDR-DM Is the green light on?

DMP-CM ...

15 27 19 ACDR-DM Okay, group, we'd better synchronize the clock; it's 8 minutes, right?

DMP-CM Check. ... How do you read, Vance?

CMP-OM I read you fine.

DMP-CM Okay. You've got about 30 seconds ... clock.

DMP-CM ... Okay ...

CMP-OM I read you.

ACDR-DM ... I got ... but we haven't put any stuff through here.

DMP-CM Yeah.

15 29 03 ACDR-DM Roger. Hey, Bo, this is Tom. I'm in the docking module working on step 2 of the third transfer. Do you want us to go up here and - and go through this checklist ... removing these samples.

15 29 24 ACDR-DM Okay. The temperature's 29 degrees and the FURNACE COOL light's on, so we can go do it.

ACDR-DM I got it. I've already got it marked out.

15 30 14 ACDR-DM All right, Bo.

CC-H ...

ACDR-DM Yeah. ...

ACDR-DM Yeah. ...

DMP-CM ...

ACDR-DM Yeah. ...

15 32 33 ACDR-DM Okay. Try it. Got it?

ACDR-DM What about that ...? Weren't we supposed to ...? In 5 minutes, ... transfer to ... I ...

ACDR-DM Oh, yeah.

15 34 49 ACDR-DM Yeah. I found it. Yep, it's there ...

CMP-OM Tom.

ACDR-DM ... difference between ... Okay.

DMP-CM Vance ...  
 15 36 35 ACDR-DM Okay.  
 ACDR-DM Okay.  
 DMP-CM Oh, okay. All right.  
 ACDR-DM Yeah.  
 DMP-CM ...  
 ACDR-DM ...  
 DMP ... yeah.  
 ACDR-DM They're all ON, Bo.  
 ACDR-DM Thought they were.  
 ACDR-DM Yeah.  
 SFE-OM Apollo, Soyuz. How do you read me?  
 SFE-OM Apollo, Soyuz. How do you read me?  
 DMP-CM (I hear you excellently, Valeriy. Stand by.)  
 SFE-OM What step are you doing now?  
 DMP-CM Okay. They want to know what step you're on there.  
 15 40 33 SFE-OM Apollo, Soyuz. What step are - step are you doing  
 now?  
 SFE-OM Please, Apollo. What step are you doing now?  
 ACDR-DM (Step 2.)  
 ACDR-DM ... Take that ... over. ...  
 DMP-CM Okay.  
 CMP-OM Yeah. Yeah.  
 ACDR-DM Go ahead, Bo.

ACDR-DM Yeah, it was. We started the transfer time on schedule. We had to go back and pick up the furnace sample and sign in a couple of books and things.

ACDR-DM Okay?

15 42 04 ACDR-DM Roger. We'll be making it up.

15 43 10 ACDR-DM Okay. ... I thought we were eating and didn't discuss that ... I'll come and get it. Okay. Take that off? Okay, I'm going to -

DMP-CM Okay. ... is closed.

15 44 55 ACDR-DM Yeah, well. ... Oh yeah. (Laughter)

15 45 35 ACDR-DM Okay. Hatch 2's closed. (Hatch 2's closed ...)

SFE-OM ...

ACDR-DM (Valeriy, Vance, now I'm working on step 7 in the docking module.)

CMP-DM (Step 7.)

15 46 26 SFE-OM Soyuz tunnel 2 pressure equalization.

DMP-CM ..., Bo, are you reading okay?

DMP-CM Okay. Yeah, I got mixed up. Our commentary says ...

15 47 08 ACDR-DM (Soyuz, this is Apollo. I am now beginning pressurization.)

15 48 04 ACDR-DM Okay, Bo. We're pressurizing the DM.

16 02 16 SCDR-DM (I used the last film for it.)

16 05 34 ACDR-DM (Valeriy, do you need any nitrogen?)

ACDR-DM ... how do you read - docking module?

ACDR-DM Okay. Up to step 13 now. Looks like we're back on schedule and appreciate your help on the rapid check on hatch 2.

ACDR-DM Pardon me, no; it was step 15. I couldn't read this thing. I've already gone through 13. We're up to step 15.

16 06 30 ACDR-DM (All right.)

ACDR-DM And they don't need any nitrogen.

16 07 52 ACDR-DM Hello, Houston, docking module.

ACDR-DM Everything is going smooth here. Is Lunney around there?

ACDR-DM Okay. You might tell him - I don't know whether I mentioned it or not - I just happened to check the roll index angle that we put on, you know, between the command module and the docking module.

ACDR-DM It's about as close as you can get it to zero. Maybe it's less than a 20th to a 50th of a degree off.

16 08 25 ACDR-DM Yeah. (Laughter) In other words, the zero line is just darn near splitting the other index line.

16 10 39 CC-M (Well, how's the comm check.)

CC-M (End 22 4 comm check.)

16 15 48 ACDR-OM Houston, Apollo. How do you read me over in the orbital module?

ACDR-OM Roger; Bo. Read you 5 by. All connected up for the comm over here in the OM.

16 17 15 SFE-OM Deke, how do you read me?

DMP-CM (Excellently, Valeriy.)

SFE-OM (This is Soyuz. How do you read? Over.)

DMP-CM Go ahead, Bo.

16 18 40 DMP-CM Okay. CM 1 and 2 coming OFF.

ACDR-OM Yeah.

16 23 01 SFE-OM Vance, how do you read me?

DMP-DM (I read you excellently.)

SCDR-OM (Valeriy, how do you hear me?)

SCDR-OM (Okay, Valeriy, how do you read me? I don't read you now.)

16 23 35 ACDR-OM Houston, Apollo.

ACDR-OM Okay, Bo. Sounds like Valeriy's having the same trouble Alexey had this morning. He can read everybody, but he can't transmit. But Vance and him are going to press right on through the transfer.

ACDR-OM Roger. Will do.

16 24 15 ACDR-OM Roger. 1, 2, 3, 4, 5, (5, 4, 3, 2, 1. How did you read that?)

SCDR-OM Houston, this is Soyuz commander. How do you read me?

SCDR-OM I give you short: 1, 2, 3, 4, 5 - 5, 4, 3, 2, 1. How do you read me?

SCDR-OM I read you loud and clear, too.

ACDR-OM Okay. I'll check with Mos\*\*\* (Moscow, Moscow, how do you read me? This is Apollo commander.)

ACDR-OM Houston, this is Tom. It says in the Flight Plan you want us to check with Moscow, too? Over.

CC-H That's right ...

16 25 17 ACDR-OM (Moscow, Moscow. How do you read me?)

ACDR-OM (Moscow, Moscow, this is Apollo. How do you read? Over.)

16 25 56 ACDR-OM Bo, I don't get them anyplace. Maybe we're configured wrong back on the command module. I don't know.

ACDR-OM Okay. ...

ACDR-OM (Moscow, Moscow. This is Apollo. How do you read? Over.)

16 27 56 SFE-DM (Valeriy, Soyuz 2. I hear you well.)

SFE-DM (What did you say?)

SFE-DM (Roger.)

SFE-DM (Micro - VRT power - that is microphone power's turned on. Intercom light is on.)

16 28 56 ACDR-OM (Moscow, Moscow, this is Apollo. How do you read me?)

ACDR-OM Roger. (Yes, I hear you excellently.)

16 29 42 SCDR-OM Roger. Hatch 4 is closed.

CMP-DM (Good.)

SCDR-OM Moscow, this is Soyuz. I read you loud and clear.

SCDR-OM Okay.

ACDR-OM Hello, Bob. How is it going?

MCC-M ...

16 30 53 ACDR-OM (Alexey, are you ready to dump pressure in tunnel 2?)

SCDR-OM Just a moment, just a moment.

DMP-CM Okay.

16 31 16 ACDR-OM (Okay. Roger, Bo. Roger.)

16 32 33 SCDR-OM Deke, hatch number 4 is closed. Ready for tunnel 2 depressurization.



SCDR-OM (Standing by, Moscow.)

SCDR-OM (Read you very well. The second comm check - -)

16 33 21 SCDR-OM (Okay, I know, I hear you.)

16 38 37 ACDR-OM Roger. 76:44, Quito. Thank you.

16 40 35 CMP-DM Soyuz, this is Apollo. Hatch 3 and 4 pressure integrity okay.

SCDR-OM Roger. I will have my results in 2 minutes.

16 42 49 SCDR-OM Vance, the results of our pressure check are okay. Go ahead.

16 47 46 DMP-CM Do you read, Tom?

ACDR-OM Hello. Yeah, go head, Deke.

DMP-CM Rog. ...

ACDR-OM Deke, did you call?

DMP-CM Yeah. I'm looking for the floodlight[?] ...

ACDR-OM Read you about 3 by 3. Go ahead.

DMP-CM ... I was looking for the floodlight[?]. Did you have that up in the DM?

16 50 37 CMP-DM ...

16 55 22 USSR Go ahead.

16 57 53 ACDR-OM (Hello. Good day. Hello. Good morning - )

16 59 00 ACDR-OM (...)

16 59 33 ACDR-OM (...)

16 59 59 DMP-CM Okay. ...

SCDR-OM What did you say that ... What are you going ... What do you mean, spacecraft or cable?

TIME SKIP

17 44 39 SFE

(First of all, we found out that we can work together in space and cooperate. If - until this time, we had only been preparing for it - training it. Now we have tested it out in practice. Yesterday and today have proved to us that at the time of our meeting in space - during our rendezvous, our docking, and now during the time of joint activities - we accomplished it all. And this is the most important thing. This proved that we can work together; we can cooperate in space and, secondly, we checked out and proved that the docking system works - that it works as it was designed. In other words, that the technical ideas that had been - and the technical design and the ideas that had been used have proven themselves. Yesterday this was also proven. Thirdly, of course, we received additional flight experience at the same time on - in two spacecraft. This would give us a great deal in terms of training or preparing for future flights.)

17 46 11 CMP-CM

Well, I think the greatest part of our learning, Bo, has been in our training, .... I think - I've learned a lot - I think, of course, that if we had another joint flight someday that I'd find it much easier to approach, and if somebody else was on this flight, I'd have a lot of suggestions for him. And I'd certainly recommend such a thing, incidentally.

17 47 31 SCDR-OM

(Today, I have spent 6 hours aboard the spacecraft Apollo in flight - in space, but before this I had been aboard this spacecraft many times before in training. And as a pilot, as a cosmonaut, I like this spacecraft very much. Its appearance, its maneuverability, its capabilities; but, of course, the Apollo has proven itself already - that it's a reliable spacecraft, which makes it possible to accomplish many difficult missions. And even the most difficult mission, which is - involves flying around the Moon and even partially a landing mission. Today I saw it - how it looks in space flight. I like its capabilities for making observations. There are a sufficiently large number of windows to observe the Earth and its equipment. Today, in our flight, I had to do a TV report about space food from onboard the Apollo spacecraft, but for technical reasons it didn't come through because there was no communication. But I can say that the food, which I selected way back on Earth, was the same here and I liked it very

much. I liked the way it's prepared, its freshness, and also with the - in the terms of attention paid by the crew. But once again, I'd like to say that space food is not the same food, which is eaten by people on Earth, no.) But as an old philosopher says, "The best part of a good dinner is not what you eat but with whom you eat." Today I have dinner together with my very good friends Tom Stafford and Deke Slayton because it was best part of my dinner.

17 50 00 DMP-CM ...

17 51 28 SCDR-OM (I am deeply convinced that all of us now - those that are flying aboard spacecraft and those who are not flying, but who are watching and listening to us - all of us are participants of only the beginning of a great human journey into outer space, and there will be all kinds of various space missions in the future. Of course, I would like to once again to be aboard some other spacecraft, which would be able to fly for a long time around the Earth so that with the eyes of an artist I could see the multifaceted appearance of our Earth in very varied colors and appearances to forever retain it into memory and to give it to people. But also we would like - I would like to be at altitudes higher than we are now. From there, the Earth looks completely different. I think that at the beginning of our journey - I think that I am at the beginning of my journey and still we have - we have still a reserve of strength and age and I think we will participate in future space missions.)

17 53 04 ACDR-OM Well, you're talking about the next mission. I would think, naturally, with the background in flight tests that you'd always like to fly a new and a better and a more modern device, and we have one coming along called the Shuttle. I would certainly like to fly that. And I would hope that if Alexey would have a vehicle developed by their country that we could fly maybe in a joint mission. And that would be my - my wish: since man's progress has always been a geometric progress and the benefits derived from science and technology has always helped all of mankind - I would hope that the next mission - say if I do fly one - will be one of the more modern type of vehicle that could have more benefits for everybody.

17 53 54 SCDR-OM (And I also agree with Tom and I'd like to say that it's - the spacecraft is one thing, but another thing is with whom you're flying and I'd - this is what I'd like to point out, that I would always like to fly in space with friends to who one trusts and who trusts in one and with whom it is not dull to work with.)

17 54 31 ACDR-OM (Of course, it is very important.) I say, of course, it was necessary again. We developed this technique out of working together over a period of nearly a year, and that was over a year and a half ago that we determined that, if we would listen to the other person speak in your own tongue, the individual would speak slower, also more distinctly, and would make fewer mistakes. And so it worked out beautiful as you saw in the rendezvous, and the end results you saw on television, and what you're seeing now. It's also been a great experience for us as far as a - way of communicating with each other. Over.

17 55 32 SCDR-OM (We - when we began working on the Apollo-Soyuz Program, the first part of our program was the working out of a rescue system and of a single, androgynous docking unit and testing of that unit. And now we can say that we have done - we have completed the major part - basic part of this program. We have tested these docking units. They work well and they hold us together tightly - strongly. This was the beginning of a large effort in standardizing future systems not just with both our governments or both our countries because future spacecrafts of our country and of the United States would use such units. But we suggest that other states - other countries which will dev - begin developing in this direction, we suggest that they should also have standardized docking units, so that they would be able to perform any kind of service and render any type of assistance to other crews in space. And it is pleasant to us that the beginning of this great grandiose human effort in space has been initiated by our crews here - by our crews of the spacecraft Apollo and the crew of the spacecraft Soyuz.)

17 57 22 CMP-CM Well, I think frankly, that the chances are very good, but I don't think it will happen right away. They say that - well, it would probably take at least 20 or 30 years before we would be ready as a world

to go out and explore a planet. I think that's probably reasonable. The only thing, in everything else that we have done, in aviation, for example, we've found that progress was always much faster than we expected. So perhaps the time will come when we will be thinking of exploring planets, probably together - within the next 20 years. I think that would be the way to do it. I think it would save us time, effort, money; it would pool resources, it would - in other words, it would be interesting and it would bring ben - bring back benefits to the whole world.

MCC-H Thank you, Vance. ...

17 58 42 ACDR-OM Well, when - as long as you have motion, you're going to have accidents. Needless to say that - we do all our - our utmost efforts to minimize all the risk. However, after a long period of time, you could conceivably and possibly have some mishap that would require a rescue. The total system we have demonstrated here - that new docking device, the rendezvous system using techniques from both countries, the communications procedures and techniques - could be available in the future if required. Not on an instant's notice, but it could be available. So I think we have taken a great step, that indeed we have opened a new era in the history of man on this, and it will be beneficial. Over.

17 59 47 SCDR-OM Thank you very much.

DMP-CM Okay. Now we're going to get the film. Okay.

SCDR-OM Valeriy, how do you read me?

SFE-CM Okay.

ACDR-OM Bo, how's the weather back in Houston?

DMP-CM Okay, we'd better start getting to work here, I guess.

CMP-CM Okay. ...

18 07 13 DMP-CM Okay, thank you.

DMP-CM Okay, I'll ... regular, anyway. ... your ...

CMP-CM Yep.

18 12 00 DMP-CM Okay, the problem is we've got ... right now.

18 12 29 DMP-CM Never can be sure. ...

CMP-CM ... Valeriy.

18 13 18 DMP-CM Oh, I know, I know why ... ..

DMP-CM Okay. Well, ... the ... thing that I do is Earth obs.  
... cloud cover ...

18 15 10 DMP-CM ... Yeah.

DMP-CM Okay. ... the floodlight down here. ...

DMP-CM Okay. ...

18 23 17 CMP-CM Alexey.

18 23 24 CMP-CM (Soyuz, how do you hear me?)

18 23 32 CMP-CM (Alexey, how do you hear me?)

CMP-CM Okay. Now.

CMP-CM ...

18 24 55 CMP-CM Okay. ... Valeriy, (...) Got that. (...) Okay.  
(...)

18 26 25 ACDR-CM How about letting me ...

CMP-CM Yeah. I've been looking for the cottonpickin'  
camera, only ... can't find it.

DMP-CM Well, take the one here, take the handhold, and ...

18 26 38 CMP-CM (Okay. Please speak.)

18 26 45 CMP-CM (...)

CMP-CM Okay. Boy, we've got some reconfiguring to do here.

DMP-CM ...

CMP-CM Okay. ...

DMP-CM ... Okay.

18 27 34 CMP-CM Okay. Well, we've got to change the lens on the other camera. I'm pretty sure.

DMP-CM ...

CMP-CM Yeah. Right. Remove wide angle. Now if I can find the wide angle.

DMP-CM ...

CMP-CM What?

DMP-CM ...

CMP-CM Oh. Well, I'm looking. I'm kind of worried, though, because I haven't found it. Oh wait. Oh boy, I wonder where it is.

DMP-CM Not there.

18 28 14 CMP-CM Nope.

DMP-CM ... Tom ...

CMP-CM No telling where he put it.

CMP-CM Would you call him, I wasn't able to get him a minute ago. I sure can't find it. I don't know what it looks like.

DMP-CM ...

18 29 10 CMP-CM Hey, Tom, how do you read?

ACDR-OM Loud and clear. How me?

CMP-CM Okay I've got you now. Hey, we're really hanging here, looking for the - the zoom lens for the TV. Do you happen to remember where that is? It's not in F-2.

ACDR-OM It's not in F-2?

CMP-CM No.

ACDR-OM Perhaps it's on the left side of the couch.

DMP-CM Wait a minute.

18 29 45 ACDR-OM Are you sure you don't have it up?

CMP-CM Okay. It's just that - -

ACDR-OM You know, I bet you'll find it up because that's where it was set up. I changed it out after - the tour yesterday. ... where it said change it to a wide angle.

CMP-CM Well. It's not in F-1, is it?

DMP-CM No. I doubt it. ... put it there because ... right.

CMP-CM Okay. Why don't you just go ahead and set up the angles, and I'll keep looking. Oh, boy. How in the heck - here it is. God damn.

ACDR-OM The only other place I can think is ... look in one of those TSBs, you know, either somewhere on the right or the left.

18 30 33 CMP-CM Okay. We found it. We found it.

ACDR-OM Where was it?

CMP-CM It was toward the very back of F-1.

ACDR-OM You mean F-2, don't you?

CMP-CM I mean F-2.

ACDR-OM Yeah. Okay. ... - -

18 30 47 CMP-CM There you go.

ACDR-OM - - in F-2 ...

DMP-CM Okay. ... I'm supposed to disconnect ... and move it here.

CMP-CM Okay.

DMP-CM I can't because I've got to go backwards, ...



CMP-CM Okay. What CCU do you want ...?

DMP-CM ... 9 ... 8.

DMP-CM Can you install it there?

DMP-CM ...

18 31 36 CMP-CM Okay.

18 31 43 DMP-CM I'll bet you those valves ...

CMP-CM ...

DMP-CM ...

DMP-CM ...

DMP-CM ...

CMP-CM ...

18 32 52 DMP-CM Did already. ...

18 33 44 DMP-CM ...

18 38 19 CMP-CM That camera in back of me won't see anything any-  
way. Nope. Oops. Okay. Valeriy, we got a good  
scene. This is a crazy attitude.

CMP-CM ...

CMP-CM Yeah. I guess I must be going backwards. Well,  
sideways at least.

CMP-CM Okay. Can I have your - comm cable Deke?

DMP-CM Yeah.

CMP-CM Thanks.

18 39 26 CMP-CM Houston, Apollo. How do you read? ... Okay. ...  
Ah. Okay. (Fine.) Houston, Apollo. How do you  
read? Houston, Apollo. Okay, no? Well, maybe we're  
too early.

18 40 18 CMP-CM ... Got to keep ...

18 40 34 CMP-CM Houston, Apollo. How do you read?

CMP-CM ...

CMP-CM Yeah. ... What do you think this is, Deke? Yeah. Do you know what it is? Yeah. I see. I was just wondering if you'd recognize it. Okay.

18 41 30 CC-H Apollo, Houston through MILA. Over.

18 41 37 CMP-CM Okay. Now - Let's see what we got to catch up on here.

18 54 05 SCDR-OM (Kubasov. Kubasov.)

CMP-CM Valeriy.

SFE-CM ...

18 54 18 CMP-CM (Speak.)

SFE-CM (...)

SCDR-OM Hey, Kubasov.

SFE-CM (Who is calling Soyuz 2?)

SCDR-OM (I am Soyuz. I am calling you.)

SFE-CM (What's the matter, Soyuz 2?)

18 54 37 SCDR-OM (Listen, did you connect TK-3 connector to J-box?)

CMP-CM Okay. This must be the - kit number 4.

SCDR-OM (Roger.)

18 55 03 CMP-CM Go ahead.

SCDR-OM (Moscow, this is Soyuz. How do you read me?)

SCDR-OM (Moscow, when I came over there, I connected our TK-3 and mounted it there. Then, I returned it to another mount, but I didn't disconnect the connector according to the documentation.)

SCDR-OM (I wasn't supposed to do it anyway. Moscow, did you copy?)

18 55 53 CMP-CM Gee, Bo, would you try again? You were cut out there, then.

18 56 10 CMP-CM Hey, Deke. If you're through, why, just put ... on sampling. If you're through there, we've got to finish the sampling and get going on that -

18 56 28 ACDR-OM Go ahead, Bo.

19 00 32 ACDR-OM Roger. Did you want to cover this presentation of seeds and these medals on TV? Over.

CC-H Roger. And we see you on TV now.

19 01 24 USA (... very well ... to MCC-Houston ...)

USA Affirmative.

USSR' (...)

CC-H Command module, Houston.

DMP-CM Roger.

19 02 04 CC-H On panel 10, we would like to request you to check the S BAND thumbwheel to 3.

SCDR-OM ... you must have ...

CC-H Command module, Houston. Over.

CC-H Command module, Houston. That was the FM thumbwheel to 3.

SCDR-OM You will hold the ... please, beginning ...

ACDR-OM Okay, Bo. You ready?

CC-H Roger. We can see you holding the box there.

ACDR-OM Okay. (I'm beginning. Allow me to present to you on behalf of the United States of America, to give your people and your government a present of the United States, a present to your people.)

19 03 10 SCDR-OM I am sure good trees must grow from these seeds.

CC-H Apollo commander, Houston. We're not reading Alexey.

USA (... our contact ...)

ACDR-OM Okay. Say again, Bo. Did you see that?

CC-H We read you, but we didn't read Alexey during the last part of his acceptance.

SCDR-OM (How do you read me?) How do you read me?

CC-H (Now we read you, Alexey.)

USA ... get back to ...

ACDR-OM (Joint medal for the Soyuz-Apollo mission between the United States of America and the Soviet Union.)

19 04 49 SCDR-OM (Good evening, dear television viewers. ... it's already 22:00 hours in Moscow time. The final operations are taking place aboard the spacecraft. At this time - Tom, a little bit lower. That's it. Lower. At this time, aboard the Soyuz spacecraft we have Apollo commander Tom Stafford, while Valeriy together with Vance Brand and Deke Slayton are aboard Apollo. Our joint operations are coming to an end. We are concluding ...)

USA ... Apollo ... Number 330, Roger.

SCDR-OM (Our final operations ... Tom Stafford gave me pine seeds in this little red container - box ...)

USA ... Apollo ... read your ...

19 06 49 SCDR-OM (... growth on the territory of our nation. The final operations - medals joined in space. One half of the medal was launched aboard Apollo, and the second half of the medal was launched on Soyuz. And now we here in the orbit of an artificial Earth satellite - we join these two halves, Tom. The medal carries the emblem of our flight - docked Apollo and Soyuz spacecraft. On the reverse, two flags side-by-side - the flags of the Soviet Union and the United States of America. I am giving this medal to Tom Stafford, and Valeriy Kubasov will bring back from Apollo the other medal, which we will return to the Soviet Union.)

19 07 19 ACDR-OM Okay. (Thank you very much.)

19 07 26 SCDR-OM (What have we done in this time? We had very saturated program - had to do quite a number of operations in a very limited amount of time. We had to do a series of transfers, also watch the systems on-board our spacecraft. All this requires very careful monitoring, very careful observations. Also, at the same time, we had to perform a whole series of reports, still pictures, movies. We only had five people here between the two spacecrafts - five crewmembers, and that's really not enough people to do all the things that we had to do, but we had to find a way to do it.)

19 08 27 ACDR-OM Okay, Houston.

SCDR-OM (Give us the image ...)

SCDR-OM (... , how and where.)

ACDR-OM Okay. Command module, say again.

SCDR-OM (Who turned it off? We really shouldn't have anything bother anybody.)

19 09 36 ACDR-OM Vance, how do you read?

ACDR-OM Deke, how do you read?

DMP-CM ...

ACDR-OM Okay. I was just trying to get through with the rest of the - Deke and Vance are putting the - those medals together with Valeriy. They want - they're going to say something on TV, I was listening here.

SCDR-OM (Roger.)

19 11 27 CMP-CM Go ahead, Houston.

CC-H ...

CMP-CM (Yeah, we don't have the filter.)

CMP-CM Okay. We can look again.

CMP-CM Deke, do you mind -

DMP-CM Yeah.

CMP-CM Do you mind, kind of letting me get by here and I'll check for that filter again. But I sure don't know where it went. On that ... camera filters. Maybe I can find it.

CMP-CM ...

DMP-CM Yeah. Let me get ...

19 13 10 ACDR-OM Vance, how do you read; I haven't been reading you at all.

CMP-CM Okay, Houston. Reading you loud and clear; and, Tom, reading you loud and clear.

ACDR-OM Okay. I can read you now.

CMP-CM ... Okay.

CMP-CM Okeydoke.

DMP-CM - been up to.

DMP-CM Okay. You getting ... down there?

CMP-CM Yeah. I'm setting clock sync. If I can find it - if I can find the time.

DMP-CM ...

19 14 45 DMP-CM What have we got in here, Vance?

CMP-CM Supposed to - see, that was supposed to be, Deke, several things there. Signing certificates, one thing or another ... Okay.

CMP-CM (Soyuz, this is Apollo.)

SCDR-OM How do you read me?

CMP-CM (Good, Alexey. We've got about 50 seconds to time sync.)

SCDR-OM Yes.

CMP-CM (Giving count down now. 7, 6, 5, 4, 3, 2, 1 - )

19 16 04 CMP-CM MARK.

SCDR-OM We are synchronized.

CMP-CM (That's good.)

DMP-CM Okay. That damn clock ...

CMP-CM No.

DMP-CM ... worry about that. ...

CMP-CM Okay.

SCDR-OM (...)

CMP-CM (Yes. Yes.) Okay. (The other ...) Hey, ...

CMP-CM If Bo will what?

DMP-CM The filters aren't ..., Bo.

CMP-CM All right. We're looking for the big camera filter, Bo. Hey, Tom, have you seen that?

ACDR-OM Hey, Vance. It was either back on the one in 605 or in F-2.

19 17 54 CMP-CM Rog. It's not in F-2.

DMP-CM That's where it was the last I saw it, was in F-2.

SCDR-OM Tom.

DMP-CM Okay. Let's press on here. We're getting - -

CMP-CM Yeah.

SCDR-OM (...)

ACDR-OM (Yes. ...)

19 18 11 CMP-CM Okay.

SCDR-OM Tom.

CMP-CM (The hatch is open.)

ACDR-OM ...

SCDR-OM ...

CMP-CM (The hatch is open.)

DMP-CM Also, there's ... down here.

CMP-CM Yeah. ... say docking ... No. Let's look under the ... here ...

19 18 43 DMP-CM Okay.

CMP-CM Okay. Valeriy.

DMP-CM (Okay. Please.)

CMP-CM (...) Yeah.

CMP-CM (Yes. ...) Yeah. ...

CMP-CM Got you. Okay. ...

ACDR-OM ... in the bag. ... in the bag. ... which bag did you look?

DMP-CM Okay. I'll just put these back ...

19 22 08 CMP-CM I think we should put thse back in here, too. ... Where do you want me to put them ... Where do we ...? In what?

DMP-CM ...

CMP-CM Hey, they're falling apart.

DMP-CM ...

19 23 00 CMP-CM ... Okay. (Open. Yes, yes.)

DMP-CM No, not in ...

CMP-CM Huh?

DMP-CM ...

CMP-CM ...



DMP-CM Yeah.

CMP-CM You give me ours?

DMP-CM ... ours ...

CMP-CM Oh, okay. Good. (Good. This is - gave - I -)

ACDR-OM ...

CMP-CM ... Yeah. ... Yep.

DMP-CM ...

CMP-CM Okay. Except we've got something for him.

DMP-CM ...

CMP-CM Okay.

19 23 56 DMP-CM Valeriy? (...)

CMP-CM (Our hatch is open.)

DMP-CM ...

CMP-CM Yeah. (Help ...)

CMP-CM (After the flight, how do you say ... In America, we will print the time of launch and landing.)  
(Laughter) Lift-off and ... landing.

19 25 48 CMP-CM (What) Oh, yeah. Yeah. (This is -)

DMP-CM Okay. I've got the film.

CMP-CM (Yes. This is film.)

CMP-CM Oh! Okay.

DMP-CM Okay. I'm going up in the DM.

CMP-CM Okay.

DMP-CM ...

CMP-CM Where's the DM Checklist - -

DMP-CM I don't know, but where'd you put it ...

19 26 24 DMP-DM Okay. Okay. (We're beginning operations in the docking module.)

DMP-DM I think I put it there, Vance. Check and see.

CMP-CM Okay. All right.

19 26 40 DMP-DM Okay, Bo, if you're reading, I got the 35 flash ...

CC-H ...

CMP-CM Okay. I'm stowing AS-2 kits 3 and 4, ...

DMP-DM Okay, that's the - -

CMP-CM The bungee bags. Yeah.

DMP-DM I got them now. I think we ...

DMP-DM Okay. And I'll turn off the TV STATION SELECT and do the TV things here.

DMP-DM Okay. And I'll head for the DM.

CMP-CM Okay, just - yeah. You've packed the - you're - you're ... It's the DM TV camera prep, if you will.

DMP-DM ... - -

CMP-CM Yeah.

DMP-DM - - what to do.

CMP-CM Okay.

DMP-DM ...

CMP-CM Okay.

19 28 16 CMP-CM Okay. Guys do a ...

CMP-CM Go ahead, Bo.

CMP-CM Oh, okay. No.

ACDR-OM ... We're just finishing up - -

USSR ...

ACDR-OM - - the third - -

USSR ...

ACDR-OM - - period up here and relaxing a little bit.

CMP-CM (That's fine.)

19 29 04 ACDR-OM We've had a wonderful experience here. And Alexey and I are looking at the procedures to go through now. We also had a snack.

ACDR-OM Bo, are you sending the TV over to the Soviet Union at this time? Over.

ACDR-OM I'd like to just say hello to the people there.

ACDR-OM Okay.

USSR ...

ACDR-OM Okay. It'll take about a minute or 2.

CMP-CM Yeah. Oh. Deke, the ... - -

ACDR-OM (Dear Soviet television viewers. Allow me as the representative of the United States of America to send to you best regards from the people of the United States. This is a happy time for the whole crew. We're happy, very happy to receive - to be together here in the first international flight after 2 years of joint preparation and training. We astronauts and cosmonauts - not only - not only have worked together, but we've become good friends. I'm sure that our joint work, friendship, will continue, even after this flight.)

19 30 56 CMP-CM (...)

ACDR-OM (I am also sure, dear television viewers, that this flight will open the way to further cooperation and friendship between our two countries. The - yesterday's - let the things that went on yesterday and today in our flight be a good thing for both of our peoples. Thank you and good luck.)

USSR (...)

19 31 33 DMP-DM Hey, Bo, you reading the DM?

DMP-DM Okay. Over. Which TMs - or TV do you want back in here? We took one out, you know, and I'm supposed to check the monitor, and we've got nothing here - -

19 31 50 SCDR-OM Ladies and gentlemen of the press. You can see with me Tom Stafford, Soyuz - Apollo commander, today in space - -

ACDR-OM We ... see - -

SCDR-OM - - in orbital module of the Soyuz spacecraft, the representatives of two countries: Soviet Union and the United States - United States and Soviet Union. We are conducting - we are conducting our Soviet - -

DMP-CM ...

SCDR-OM - - our joint Soviet/American flight because our people - -

CMP Yeah.

SCDR-OM - - and our governments want to work together in spirit of cooperation between our country, because a lot of experts in the America and in the Soviet Union did a great job to make this flight possible. We worked together during - for 2 - for 2-1/2 years. We know each other very well. I know Tom Stafford; Deke Slayton, and Vance Brand are very hard-working guys. We like working together with them. Before our joint flight, we were a lot of times in the United States and the American astronauts were a lot

of times in the Soviet Union. Every time we knew each other better and better. We know a lot about America, American people, about American customs. We know what the American people want. I am very glad that today we work - we are working in space together with our good friends, Tom, Deke, and Vance. I'm sure that our joint flight is the beginning of very great cooperation in space. Thank you very much.

DMP-DM Go ahead, Bo.

ACDR-OM ... How do you read?

DMP-DM Yes, but which one?

ACDR-OM ...

DMP-DM You going to replace the one under ...?

ACDR-OM Hey, Deke, what step are you doing now?

DMP-DM Okay. I thought you wanted the TSB ...

DMP-DM Okay, ...

19 35 37 SCDR-OM Deke, how do you read me?

DMP-DM (Excellent, Alexey.)

SCDR-OM What are you doing now?

DMP-DM (First ...)

19 36 07 SCDR-OM (How do you read me?)

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20 01 59 CMP-CM Bo, how do you read? CP.

20 02 57 DMP-DM ... Over.

CMP-CM Go ahead, Deke.

DMP-DM (... pressure ...)

20 03 37 SCDR-OM Partial pressure oxygen 120, CO<sub>2</sub> 4 millimeters. Okay?

ACDR-OM Yeah.

20 05 00 SCDR-OM Okay. We're going to proceed to open hatch number 4.

20 06 10 SCDR-OM Hatch number 4 is open.

CMP-CM ...

20 18 03 CMP-CM Roger. Loud and clear.

CMP-CM Okay.

ACDR-OM Hey there, Bo. We're all over in the DM here - or OM, rather - -

SCDR-OM (Laughter) Houston ... (laughter), Houston.

ACDR-OM - - with the old microbial exchange.

ACDR-OM Right.

CMP-CM Okay, Bo.

20 20 48 SFE-DM (Moscow, this is Soyuz 2.)

SFE-DM (... Not bad. How do you read, Moscow? This is Soyuz.)

SCDR-OM (Moscow, this is Soyuz. The situation onboard is as follows: We're conducting the microbial flora sampling experiment; hatch 4 is open; final operation of the fourth transfer.)

20 21 39 CC-H Apollo, Houston. Through Newfoundland and then ATS.

CMP-CM Okay, Bo.

DMP-DM We're on step 16, Bo.

USSR (... Story.)

USSR (... of the fourth transfer.)

CC-H Did you understand. Step number 16 and if you have a DM Checklist in your hand, would you go to page 5-16, step 26.

DMP-DM Okay. Go ahead.

CC-H Deke, did you answer me? I thought I heard you very weakly.

DMP-DM Rog. Standing by for your info.

20 22 26 CC-H Roger. Where it says, "AC DM SOYUZ TUNNEL VENT ISOLATION - OPEN and DM SOYUZ TUNNEL VENT - VENT." Cross those two steps out, temporarily, and the Soyuz crew will give you an okay to vent the tunnel to vacuum.

DMP-DM Okay, do that later ...

CC-M (Repeat Soyuz 2.)

CC-M (... 1 millimeter)

USA Yeah.

CC-H They'll give you that okay later - perhaps 20 minutes or a half hour later.

DMP-DM Okay.

DMP-DM Good.

SCDR-OM (Okay, so the first phase is 6 minutes. The standard is 10 over a period of 6 minutes. For the second phase, after 20 minutes, the standard is 1 millimeter for 6 minutes and the ...)

USSR ...

DMP-DM Well - -

20 23 52 SFE-OM (Okay, I'll clarify it one more time. Are you listening? Two phases: First phase 6 minutes; standard is 10 for 6 minutes. Second step: In 20 minutes, standard is 1 millimeter for 6. If everything is normal, inform Apollo about hatch integrity and close the caps.)

USSR (... respectively.)

SFE-OM (And at what time?)

20 24 36 DMP-DM (... 00, 54:01:09.00 each.)

USSR (What happened?)

ACDR ...

20 24 50 CMP-CM Okay.

20 30 01 ACDR-OM Okay.

USSR-OM (...)

USSR-OM (...)

20 31 11 ACDR-OM Okay, Bo. We're hooking up to the - the TV cameras in the orbital module to DMI on the docking module.

CC-H ... the report.

USSR ...

USSR ...

20 39 08 CMP No, you just got rid of it, Bo.

DMP Sounds good now, Bo.

ACDR Yeah.

20 42 20 ACDR Roger. You're all set.

DMP-OM Yeah. They've been up for a while, Bo. They're already turned on.

CC-H ...



CMP Go ahead.

CC-H ...

CMP Okay.

CC-H ...

20 43 15 CMP Yeah, that's verified. It's ON.

20 43 22 CMP TV STATION SELECT is on CM, however - would you like that - UP TELEMETRY?

CC-H ...

20 43 33 CMP You got it.

DMP-DM Okay.

ACDR (Good-by.)

USSR (Good-by.)

20 48 31 DMP (Good-by. We wish you the best of success.) We hope we've opened a new era in history of man.

USSR Good luck.

ACDR (Our next meeting will be on the ground.)

DMP (Step 20, Valeriy.)

20 50 06 SFE 20 is completed.

DMP Hey, Vance, can you read us?

CMP Yeah. Go ahead.

DMP Hey, Vance, you read?

CMP Yeah. Go ahead. Yes, I read. Go ahead, Deke.

DMP Okay, got to do a little reconfiguring here on panel 6: VHF FM to RECEIVE; AM, OFF; AUDIO CONTROL, NORMAL; verify POWER, OFF.

20 50 54 CMP Okay. It's in work.

20 51 22 CMP POWER coming OFF now.

20 52 47 DMP Okay, Vance. At panel 6 here, FM, T/R; AM, T/R, POWER ...

DMP (Two shutters.)

20 56 45 ACDR Okay, Bo. Valeriy's working on their hatch and getting things set up for the UVA eclipse.

ACDR Solar eclipse.

21 00 17 ACDR Okay, they're closing hatch 4.

21 01 01 ACDR Tunnel is closed. Hatch 3 is closed. (Hatch 3.)

ACDR Vance, you read? Vance, you read us?

DMP Hello, there.

ACDR Vance, how do you read?

ACDR Vance, you read?

USSR (...)

ACDR (Soyuz, how do you read me?)

CMP How do you read, Tom? How do you read, Tom?

ACDR Loud and clear, Vance.

CMP Okay. I assume you got the connector cables disconnected.

ACDR Yeah, right. ... disconnected those power ...

CMP Okay, we must be out of configuration.

ACDR Okay. Vance, would you set MASTER on the CM camera?

21 03 37 CMP Rog. MASTER on the CM.

21 04 36 CMP Houston, Apollo.

ACDR Houston - -

CMP Houston, Apollo.

CMP Roger. I have P52 results for you.

21 05 00 CMP Okay, stars 33 and 35; NOUN 05, all balls; NOUN 93, plus 00.129, minus 00.084, minus 00.088; and we torqued at 43:00.

CMP Roger.

ACDR (Soyuz, this is Apollo. We're getting ready to dump the pressure in tunnel 2. Over.)

SCDR We are ready.

ACDR (Read you.)

21 06 49 ACDR (I'm beginning the dump.)

CMP Hey, Tom. I've got the probe and the drogue in the tunnel. When you come through, we might temporarily put them in the DM so we've got a little working room.

ACDR Yeah, I think that's a great idea. Let's go ahead and we'll - we'll stow them up here for tonight. What do you think?

CMP Super idea.

ACDR Roger.

21 08 23 CMP Roger. Three POWER switches going OFF.

21 12 29 CMP (Soyuz, this is Apollo. How do you read me?)

SCDR (Real good.)

CMP (I'm beginning the maneuver for solar orientation.)

SCDR ...

21 13 22 ACDR (Yes, right now. Roger. ... how is everything going?)

ACDR (Soyuz, Apollo. Do you read me? You do ...)

21 20 51 SCDR Okay. Understand you. (...)

21 32 44 ACDR Okay, Vance. Let's position the ... valve.

CMP Okay.

21 34 19 CMP ... five of up, too. Okay? I'm going to send container 4 up, too.

DMP Water?

CMP No.

CMP Seems to me that we're safe[?] for a few days.

21 36 26 SFE Deke, how do you read me?

DMP (Okay, Valeriy.)

SFE We forgot four ... magazines.

DMP (... repeat please.)

SFE We for - ... magazines, in the DAC.

DMP (...)

SCDR ... We took film using DAC 02 - these magazines we forget - we forgot on the Apollo spacecraft. Do you understand me?

DMP (Yes, understand, but ... when you land - after that, okay?)

SCDR You have to land it?

21 37 47 DMP (Yes.)

CMP Hello, Dick. How are you? Good to hear your voice.

21 42 44 ACDR Hello, Dick. How are you?

CC-H Hi, Tom. I'm doing great. How about you?

21 42 49 ACDR Well, ...

21 48 22 ACDR Okay. I'll check with him, Dick.

CC-H Okay.

CMP ...  
 21 49 31 SCDR How do you read?  
 ACDR (I read you loud and clear. How me?)  
 SCDR Okay, I read you loud and clear. Tunnel 2 pressure check is okay.  
 ACDR (...)  
 SCDR ...  
 ACDR (...)  
 21 50 49 SCDR We're heroes.  
 ACDR (Heroes, yes. ...)  
 21 53 48 USSR (Kavkaz, this is Soyuz. How do you read?)  
 CMP Yeah.  
 USSR (Kavkaz, Kavkaz. How do you read? Over.)  
 ACDR It's a little over 5. A little over 5.  
 21 54 26 CC-H Apollo, Houston. Newfoundland for 7 minutes.  
 ACDR Roger.  
 SCDR (Kavkaz, how do you read?)  
 21 54 58 CC-H Apollo, Houston. AOS in Newfoundland for 2 minutes - for 7 minutes, excuse me.  
 ACDR Roger.  
 CMP What do you want, Tom?  
 SCDR (Kavkaz, this is Soyuz. How do you read me? Over.)  
 CC-H And, Apollo, Houston. Just so we can keep our record straight, wonder we - if we could verify a couple of switches. One is on panel 181. Like to verify that the TV AMPLIFIER has been put to BYPASS.  
 21 55 45 CMP That's verified, Dick. That's verified, Dick.

CC-H Okay. And the other one is - when we had data, which we don't have right now here at Newfoundland, it didn't look like we had started the - or - or got the WASTE STOWAGE VENT valve to VENT. So we'd like to just verify that those two callouts about 81 hours in the Flight Plan in the CP's column had got done.

CMP Yeah, that's done. We have the QD attachment on the waste vent, and the ...

21 56 23 CC-H Okay, real fine. We'll be locking up on the ATS here very shortly. Sometime this evening, I've got a new block data pad for you. So, at your convenience, we need you - somebody gets out the Updates Book, I'll be glad to read it up.

21 56 36 CMP Okay, maybe we can get it, as soon as we have ATS.

21 56 47 SCDR (Kavkaz, ... in simplex mode ... band but they aren't responding yet.)

#### TIME SKIP

22 44 05 ACDR Real good. Thank you, Dick.

CC-H Okay. ...

ACDR Okay.

ACDR ... cue card. ...

ACDR Oh. Hold that for the UVA.

22 45 43 ACDR ..., what about ...? ... put those up ... Deke, go get the UVA cards out now,

ACDR You need to ... this ... is about all it says. Okay, ...

ACDR ...

22 48 09 CMP Houston, Apollo.

22 53 07 ACDR Yeah. We're supposed to go to bed in a couple of hours.

ACDR Vance, what have you got ...?

ACDR Does ... leave that ... zero?

DMP I didn't. I thought you meant while ...

ACDR ...

ACDR ... leave on the ...?

ACDR ...

DMP ...

22 56 49 ACDR ... hell of a long time ...

ACDR ... Well, what's ...

DMP ... Oh, man!

ACDR ...

22 59 30 ACDR Here, Deke.

ACDR You know ... Deke, you got any idea what - Oh, I see. ...

DMP Where's that Kleenex you were using? ...

ACDR Oop! ...

ACDR ...

ACDR ... that's ...

23 05 36 CC-H Apollo, Houston. Apollo, Houston. 1 minute until LOS; Goldstone at 82:57. See you there.

23 17 08 CC-H Apollo, Houston. Short pass at Goldstone for 2 minutes.

CC-H Apollo, Houston. Short pass at Goldstone for 2 minutes.

ACDR Houston, go ahead.

23 17 43 CC-H Tom, we got a real low elevation pass at Goldstone, just a couple of minutes here. We'll pick you up at Newfoundland in about 10 minutes from now.

23 24 58 ACDR Well, there's coffee in here but I'll be damned if I can see it.

ACDR All right.

23 26 27 ACDR Pardon me? ...

23 26 54 ACDR I think I could have ... it.

23 26 58 CC-H Tom -

ACDR Here it is.

23 28 18 ACDR We might as well drink some coffee. We'll probably have to ...

23 28 49 ACDR What - what do you do - what do you think of getting the purge on.

# # #



DAY 200

00 18 03 ACDR Okay, ... that.

ACDR Where's the presleep ...? 1-49.

00 20 05 ACDR Cycle the H<sub>2</sub> FANS. Chlorinate the potable water.  
...

ACDR Cycle H<sub>2</sub> FANS, S1-8. Okay, ... Okay. ON  
sequentially at 1-second intervals for 1 minute,  
then OFF. H<sub>2</sub> FANS 1 and 2.

ACDR Okay. Clean CIRCUIT RETURN valve behind 382. ...

00 22 30 ACDR ... CABIN PRESSURE RELIEF valve ... NORMAL.  
PRESSURE EQUALIZATION VALVE, CLOSED. DM TUNNEL VENT  
valve, DM/CM DELTA P. Now, the only thing is ...

00 23 25 ACDR Okay. That does it. I've already got ...

ACDR ...

ACDR All we need is to fix the ... Get this ... bracket  
... ... film back in there ... Anybody else ...

00 25 16 ACDR ... furnace ... furnace ops, page 7-3.

ACDR Oh. Canister change. 9 into A and stow 7 in D-4.

ACDR That's all right. We can make them go. ...  
Okay. ...

ACDR ...

00 28 07 ACDR ... Say what?

00 28 20 ACDR You want to turn on the cabin fans? ... cabin fans  
... CABIN FANS coming ON.

ACDR No. There's nothing here, it's ...

ACDR ...

00 31 11 ACDR Is that chlorine coming out? Can you tell, Vance?  
Good God.

ACDR The whole thing leaked out?

00 31 52 ACDR All right. I don't think we ought to call the ground  
on it. ... we did have the ...

ACDR Hey, if I do this whole - the whole thing's going to ... .. makes it better, it'd be all right. ...

ACDR ...

CMP Yes, both ...

ACDR ...

00 46 18 ACDR Hey! PARTIAL PRESSURE's up ... Get it down ... It's up to 6 psi. Fuck! ... up. ... down.

00 47 15 ACDR Is it down?

# TIME SKIP

08 18 30 CC-M (Give it to us unformatted first, then 2, and then 14.)

USSR (53.)

USSR (Squares ...)

USSR (10.)

CC-M (... per format.)

SFE (\*\*gram - ... will be in format 2 because Alexey transmitted the 14th.)

SFE (\*\*gram 2.)

USSR (...)

08 20 45 CC-M (Current - please repeat the current and activation time.)

USSR (...)

CC-M (... 67th is 1651. And the seconds?)

CC-M (Roger. Copy.)

USSR (- of potassium.)

USSR (...)

USSR (Under ... monitoring.)

CC-M (We got everything. You don't have to give us an acknowledge.)

CC-M (... isn't necessary. We have format 3, also.)

SFE (... begun. Well, okay, we'll prepare it. We'll prepare it all.)

08 29 28 CC-H Apo -

TIME SKIP

09 41 51 CMP Yeah. I guess it does look a little out of focus.

SFE (Number 12 ... the 14th and the 13th also ...)

CMP Okay. How's the focus.

DMP Well, anyhow ...

ACDR ... turned on ... - -

CC-M (...)

SCDR (We opened the MPS valve ...)

CC-M (Right.)

SFE (The pressure is 620.)

09 43 16 CMP Yeah, we - we were kind of wondering why - what it would be like ...

CMP I think we'll have to give you some wakeup ... return sometime.

CC-M (Report your current pressure.)

DMP ...

CMP ...

09 44 40 SCDR (We have now collected all equipment to be returned and stowed in the container. There's quite a bit of it. After we've finished -)

09 45 59 CC-M (We'll report on the systems. That's okay, just ...)

CMP Yeah. ...

DMP ...

SFE (... 710.)

ACDR (...) ... the outside plane.

SFE (... 780.)

CMP (...)

SFE (... 790.)

09 47 38 CMP I think it's the - it's from the attitude of the ...  
because I don't know ...

ACDR ...

CC-M (I didn't copy you.)

SCDR (The pressure is 780.)

SCDR (... 790. At the hundred mark, it will go 800 -  
795. The pressure is 800.)

CC-M (... when you release pressure the valve will freeze,  
so about 100 millimeters from what you want, it  
should be moved, otherwise it could freeze and not  
close.)

SCDR (The valve handle is now closed.)

CC-M (... how much did you use up?)

SCDR (Moscow, this is Soyuz. How do you read?)

CC-M (Copied 00.)

SCDR (Roger.)

USSR (Okay.)

CC-M (Go ahead.)

SCDR (Transmit an example.)

CC-M (... 51.)

SCDR (... 44, 45.)

09 54 27 ACDR ..., Deke, ...?

DMP I'll give you that ...

ACDR ...

SCDR (This sequence will be done from TA-1 (laughter) with TK-1.)

CC-M (Which sequence is this?)

SCDR (TV-14.1, operation per plan. TK-1 is on bracket TA-1. But there's no TK - oh, the continuation - Yes. Now it's clear, it's clear.)

CC-M (Not TK-1, but TA-1.)

SCDR (Correct, correct, we understand it all now.)

CC-M (Fine. Thank you.)

SCDR (We understand - not just TV-14.1 but also the continuation of TV-14.1.)

ACDR ... better.

DMP What?

09 56 55 ACDR ... That docking has gone softer than ... docking. When they're docked - has gone softer ... The fact that ...

ACDR Huh? Yeah. I was ... Why don't you go over there. I'm not cool over here yet.

CMP Boy, I'm sure going back to the ... Huh?

ACDR Whoever picked this attitude ...

CMP They're just going for ...

09 58 23 ACDR Oh, they're ... What about ... LiOH ...? 10 into B; stow 8 in D-4. 9 to A and 7 to D-4. ... 9 and 10.

ACDR Huh?

DMP ...

DMP Yeah.

10 04 30 ACDR Vance, you got a ...?

CMP No.

ACDR ...

CMP ...

ACDR ...

ACDR ... the ground ...

CMP I tell you, Tom, ...

ACDR Better still, we'll give ... a call and ...

10 04 58 CMP I - I don't think ...

ACDR I don't either. ...

ACDR ...

CMP ...

ACDR ...

CMP Okay.

ACDR ...

CMP ...

ACDR ...

10 06 57 CMP Boy, we all better strap ...

ACDR Oh, yeah. (Laughter)

ACDR Okay. It says ... - enter the ..., right?

CMP Yeah.

10 07 42 SCDR Apollo, Soyuz. How do you read me?

CMP ... (Well.)  
 SCDR Tom, how do you read me?  
 CMP (Well.)  
 ACDR (Very well, Alexey. How do you read me?)  
 SCDR I read you loud and clear. How are you, Tom?  
 ACDR (Very well. We slept ...)  
 10 08 09 SCDR We slept well, too. Tom, we are getting ready for undocking.  
 ACDR (Very well.)  
 ACDR Okay. ... LiOH ...  
 10 17 52 CC-H ... the one that you end up installing on panel 11 to be put in MASTER, and the one that you take over to 871 to be in SLAVE. That's just changing the position on each of those cameras.  
 10 18 04 CMP Roger. Panel 11.  
 CC-H And I'll be saying good evening to you and talk to you in the morning.  
 ACDR ...  
 10 18 25 CC-H Morning, that is.  
 10 25 50 CMP ... Flight Plan.  
 10 26 47 CMP (Soyuz, this is Apollo.)  
 CMP Hey, Tom?  
 10 28 53 CMP ... (Soyuz, this is Apollo.)  
 ACDR ... Yeah, ...  
 CMP ...?  
 ACDR Yeah, they ...  
 ACDR ...

DMP ...?  
ACDR ... the last dock ...  
ACDR ...  
10 32 40 CMP Yeah.

TIME SKIP

11 00 33 DMP See any ... buildup ...?  
CMP You know, thunderstorms look a lot closer to you.  
Yeah.  
DMP Oh, hey, Vance.  
CMP This one here? Okay?  
DMP ...  
CMP Yeah. That's what I said - that's what I said at  
first. That's one of my ...  
11 01 07 DMP ... me too ... I didn't see ...  
CMP Look at them. Are they pipes or are they mountain-  
tops?  
DMP They look like - look volcanic to me.  
CMP We're going to come up on Cairo in a minute.  
CMP I ...  
CMP Yeah.  
11 02 06 CMP Right. Time to what?  
CMP There you go. That all right?  
CMP Look at that country.  
DMP Beautiful.  
DMP Yeah. ...



11 02 54    CMP        There's Cairo.

             DMP        Now here's the - here's the Red Sea right off to my  
                         left. Come right over ...

             DMP        Unfortunately, Bo, we need about all we can get for  
                         visibility.

             CMP        Boy, there's Cairo. Really - -

             DMP        There it is. Boy!

             CMP        No problem.

             DMP        Oh, great! ...

             DMP        Yeah. We want everything we got.

11 03 26    DMP        Say, that stuff's pretty ... right there.

             CMP        Yeah. See the pyramids?

             DMP        Yeah! (Laughter)

             CMP        My God! I think I did. I've got to get a map though.

             CMP        Gosh, look at that! Look at that water. (Sneeze)

             DMP        I know where we're supposed to be, but I'm not sure  
                         I - we're going too fast.

             CMP        We're going to get a good view of the Levantine  
                         Rift here.

             DMP        ... we have a fantastic view of the -

11 04 15    CMP        Houston, look. We - we've got some fantastic view-  
                         ing and picture taking of Africa right now.

             DMP        No, we're in the Middle East right now.

             CMP        I know.

             DMP        Hey, that's Israel right down there. There's the -  
                         there's the Sea of Galilee. ... God damn - Boy,  
                         that's ...

             CMP        Yeah.

CMP Okay, I think we're ...

DMP ...

CMP Okay.

11 05 58 DMP Now's the time to use the tape recorder ...

CMP Yeah, we'll ...

DMP ... use the ...

CMP ... Baykonur.

11 06 54 DMP Okay. ...

CMP You got all the maps there.

DMP No. ...

CMP Yeah. I think you're supposed to have them.

DMP ...

CMP ... 66. Tom, you need to get the map out of ...

CMP Yeah. We got to find out where we are real - fast  
and then see if we can get Baykonur. We're ...  
R-3 ...

11 07 53 DMP Okay. ...

CMP Okay, we'll see if we ... around - -

DMP ... 06.

DMP Got to be exact about this. ...

DMP I don't know, but they're obviously - getting to be  
...

CMP Yeah.

DMP ... like - -

CMP Yeah.

11 09 08 DMP If it's half as good as ours, you ought to be having a ball.

CC-H ...

CMP Okay. Does that help?

DMP Okay. I've blocked the number 1 window here with a map. Is that helping you some?

DMP It should be around ...

CMP Yeah. We've got to be going north of it.

ACDR Yeah.

DMP I'm going to have to take it down periodically to get a view here.

DMP Yeah, it's ...

CMP Well, I'll ...

CMP Tom, ... we'll get ...

DMP Yeah.

CMP Yeah.

11 10 33 DMP That God damn caution and warning!

11 10 40 CMP I don't know why we're getting that now. ...

DMP ...

CMP ... ..

DMP ...

CMP ...

DMP ...

CMP ...

DMP Hey, could I get me one?

CMP Let's see. I guess they want the windows ...

CMP           Why don't we just put it up ...  
 11 12 28   DMP           I'll put this one in this window, Vance. ...  
 CMP           I hate to do it to the better one.  
 DMP           ... this window here now ...  
 DMP           I'll cover this one ... the cover ...  
 CMP           Tom?  
 ACDR          Yeah.  
 11 12 46   CMP           Do you feel this is more ..., covered?  
 ACDR          What?  
 DMP           I don't mean to - -  
 CMP           They need us to ... plan ...  
 ACDR          It did?  
 CMP           Oh, a little while ago.  
 DMP           This window, here, is the only one ...  
 ACDR          They want this one ... out. Hell, I just put one up  
               here with no problem.  
 CMP           Oh, yeah. ... that's ...  
 DMP           ... won't bother you. It's only in window 1.  
 ACDR          It's only window 1 and the hatch ...  
 DMP           I've got window 1 covered but it's ...  
 11 13 17   ACDR          Hello, Houston; Apollo.  
 ACDR          Roger. For a change, we thought we'd give you some  
               wake-up music.  
 11 13 32   USA           (Music: "Proud Mary")  
 ACDR          Hey, wake up.

11 15 10 SCDR (Apollo, this is Soyuz. How do you read me?)  
 DMP Yeah, you probably drowned him out ...  
 ACDR No, I turned off the FM.  
 DMP Oh, okay.  
 SCDR (Apollo, this is Soyuz. How do you read?)  
 ACDR (Excellent. How me?)  
 SCDR (I hear you poorly with a great deal of interference.)  
 ACDR (Repeat please, Soyuz ...)  
 DMP ... talking to Moscow ...  
 SCDR How do you read me?  
 ACDR Hey, Houston, we'll have the - and other good selections for you later on.  
 CC-H ...  
 11 15 50 SCDR Hey, Tom, we are now in orbital module. In 2 minutes, we are going to go to descent vehicle.  
 CMP Houston, Apollo.  
 CC-M (Moscow. Soyuz, how do you read me?)  
 SCDR (I read you excellently. We are now in the orbital module, in our spacesuits. We are transferring into the DV.)  
 ACDR ...  
 SCDR (Onboard everything is normal. The pressure is excellent and everything is on schedule.)  
 ACDR I turned off the FM ...

11 16 40    CMP       Houston, Apollo. Occasionally, we get some very good viewing because of attitude, weather, et cetera. We just now got a couple of visual observations, things that we haven't been able to get as well before. For example, saw the Levantine Rift and Egypt. I think might have seen the pyramids; that's an ... map that we have. And now I've got to see a picture or a layout of - of how the pyramids are laid out when we get back. But I saw two specks that might have been pyramids.

ACDR       ... was on the river, west - west of the river?

CMP       We think they're the pyramids of Egypt, and that happens to be a visual observation ... had.

SCDR       (Will the PEV valve remain open or closed.)

ACDR       It was on the west side of the river, west of Cairo?

CMP       Yes.

ACDR       You want me to turn this off?

CMP       No. Don't touch it.

CMP       Right.

SCDR       (... and repeat it again.)

DMP       Now's a good time to comment we haven't done much good work in that area so far due to a combination of cloud cover and time constraint.

11 18 31    MCC-M       (... the PEV cap.)

SFE       (Roger.)

MCC-M       (We've got some kind of loud noise.)

SFE       (Roger. We get that periodically.)

MCC-M       (... we didn't understand because of loud noises.)

SFE       (No. It's the OM electrical controls.)

11 19 05 ACDR Okay. We give them an undocking time at ... - -  
DMP ...  
SCDR (...)  
ACDR - - 95:43.  
DMP Soyuz, Apollo.  
DMP (Soyuz, Apollo.)  
SFE (Moscow, Soyuz. We are transferring to the DV.)

11 19 52 ACDR Huh? Yeah, change places. Yeah.  
SFE Apollo, Soyuz. Apollo, this is Soyuz. How do you read me?  
DMP (Valeriy, I read you okay.)  
SFE Quite well.  
DMP (Good. The undocking time now is 95 hours 33 minutes 20 seconds GET.)

11 20 30 SFE Thank you, Deke.

11 23 26 ACDR It does feel good to wrap those - wrap that ...  
CMP Yeah.  
DMP ...  
ACDR Let's see, undocking time is 95:43.0, right?  
DMP ...  
ACDR And, ... you got a P52 option 3 coming up ...  
ACDR 95:10. 6 or 7 minutes. You have plenty of time ...  
ACDR Yeah. I feel a hell of a lot better. ... pulled out more for you?

11 24 38 SFE (... this is Soyuz 2. I'm in the DV.)  
USSR (...)

SCDR (...) (one moment.)

USSR (...) (Has (...) been cut off on OMP?)

SFE (... Didn't understand the last part.)

MCC-M (...) (Roger.)

SFE (Roger.)

11 27 38 ACDR Okay. We've got the clock counting up.

DMP (Moan)

ACDR Okay. We're going to undock at 43. So, 20 minutes before that.

DMP Okay. ...

ACDR Say, 95:23.

11 28 04 DMP Okay. ... ..

11 29 03 DMP Okay. PRO, PRO. Do not activate.

11 29 18 CMP Yeah.

11 29 20 DMP Okay. G&N POWER - OPTICS POWER, on ... P52 option 3.

ACDR ... ENTER, VERB 46.

DMP Huh? We PRO, PROed and everything.

ACDR Okay. Okay. Just leave it like that. Go back to P00.

CMP You say P00?

ACDR Yeah. ... back to P00. ... Reset to P00. And then we can go back to - hold it.

11 29 57 ACDR '... , when we torque, will P00 wipe out that P and P? Will P00 wipe out that P and P? P00's okay.

DMP ... supposed to torque ...?



ACDR Yeah. ...

DMP Okay. But I can't see ...

ACDR Go back to 37.

DMP VERB 37 ENTER?

ACDR Yeah. Again, the POO does not wipe out that P and P. Go back to VERB 37 ENTER zero-zero.

11 30 32 DMP Okay. VERB 37, ...

11 30 39 ACDR Well, that fucking O<sub>2</sub> HIGH FLOW ...

DMP Okay. Now, ...

11 30 49 ACDR Okay. G&N OPTICS POWER, on; P52. Says 35, 36, and 40 are the stars. ... You've already done that.

ACDR ... to get the DET counting.

11 31 20 DMP ... do that. Okay, what time is it?

ACDR 95:43:20.

DMP Okay. 95 - -

ACDR ... make it 20. So say 12:20 - 12:43, make 31. Take it to 29 and we'll ...

ACDR Okay. 3, 2, 1 -

11 32 25 ACDR MARK it. Push hard. (Laughter) ...

DMP ...

ACDR ...?

DMP ... Wish that thing had decent lights.

ACDR Oh. Well - we had, you know, luminescent lights on the docking - the old lunar module type.

DMP Yeah.

11 33 50 ACDR Man, that was something. ... spotlight again, Deke.

DMP ...

ACDR Huh?

DMP ...

ACDR All right. One, two - one, two, three, four.  
Okay ... Deke. Noun 89 or ...

DMP 89. Okay.

ACDR Yeah.

DMP Okay. What next?

ACDR VERB 49.

DMP 49? Okay.

11 34 25 ACDR 95:14:15. Okay, why don't we deactivate the primary  
evaporator? ...

11 34 54 ACDR Okay, now that you got that, we can realine the GDC  
to the IMU.

ACDR Is Myrtle off?

ACDR Myrtle.

ACDR Has that got - Have we got the ... bag on?

DMP ...

ACDR Have we got - we got - we do have that - we do have  
that, Vance. If the waste stowage vent is closed,  
it'll help ... Is it closed? We got that - we got  
that elbow on it. It's supposed to clear out. No  
problem. Okay, there. We're ready in a little bit  
to command OPTICS ZERO, ZERO; G&N POWER, OFF - OPTICS,  
OFF.

CMP Deke? Do you verify CMC in AUTO?

11 36 21 DMP CMC in AUTO.

DMP Okay. We go back to ...

ACDR Okay, I'm about ready for undocking to begin. Oh.  
Come on ... CMC.

11 36 50 ACDR (Soyuz, Apollo. Over.)

SCDR - - ... Tom.

ACDR (Ours also. Please, excuse me. And how is your  
radio range?)

SCDR Okay. Ranging on, Tom.

ACDR (Thank you.)

11 37 12 DMP I don't know; couple of them in the boxes. There's  
a couple of them in the boxes. I don't know.

11 37 16 ACDR VHF AM, off, center; B to DUPLEX.

11 37 22 ACDR ANTENNA, RIGHT, verify; on the VHF gain over there.

DMP I didn't see it, Tom, but a couple of them the other  
day was in them boxes.

11 37 35 ACDR What's your DET reading, Deke?

11 37 39 DMP 34:12. Okay. ... You know - Getting dark yet?

11 37 55 ACDR Okay, go back to P00. Let's give them a mark at  
... and 24. (Soyuz this is Apollo; 5 minutes to sync  
of clocks. Over.)

SCDR Roger. We have 5 minutes before sync the last time.

ACDR Okay. ...

DMP ...

ACDR Yeah.

DMP (Yawn)

CMP Okay, that's -

CMP We got everything configured.

ACDR We got it configured ...

11 39 27 CMP Yeah. ... zeroed in.

CMP ...

ACDR ...

CMP Now, I wonder where my other tape recorder is - I wonder if it's in the same place.

ACDR Could be.

CMP Oh. Okay. Hey, why don't you grab the ...

11 41 36 ACDR I don't know about you guys, but I'm hot.

CMP ...

ACDR Yeah. ...

CMP ...

USA (Music)

CMP Yeah.

ACDR Who played this ...

11 42 02 CMP We'll have to try the girls' showers - -

ACDR Yeah.

CMP - - ... week.

ACDR Yeah, yeah. Girls' showers. (Laughter)

CMP We ought to do that while we're still docked.

ACDR Oh, hell yes!

CMP Yeah, why don't we ... Saturday? ...

ACDR (laughter)

USA (Music)

11 42 28 CMP Okay.

ACDR Okay, we're going to ...

DMP ... coming up. ... 20.

ACDR Okay.

DMP How did you ...?

11 42 51 ACDR Why don't you do it? I don't like the dumb thing.  
(Laughter) I've got one here that says it'll be at  
43:20.

DMP Yeah. 23:20.

ACDR 23:20, right.

DMP Okay.

ACDR Yeah. (Soyuz, Apollo. Ready?)

SCDR Okay, ready.

ACDR (Okay. 3, 2, 1 -)

11 43 25 ACDR MARK.

SCDR (...)

ACDR (Laughter)

ACDR (...)

SFE (...)

DMP (Laughter)

CMP ... it's my turn.

SFE (You're a genius.)

CMP ...

DMP (Laughter)

ACDR ...

CMP ...

ACDR ...

11 43 58 CMP Okay. You want to hear about what you don't do with this translation ...?

DMP No, I don't want to know; Bo might, though.

CMP Okay.

DMP ... translator?

11 44 08 CMP Yeah.

11 51 04 ACDR Okay.

CMP Hell, they're off.

11 51 07 ACDR Oh, I see. Okay. The pump's off. Every - The evaporators are off now, Bo. Yeah. We had the EVAP, OFF \*\*\*

ACDR Okay. There we go. Okay. I'm going to turn - active undocking.

DMP Okay. We have to ... Soyuz. ...

ACDR ...?

CMP Yeah.

ACDR It says here ... Okay, Deke, ...

11 51 52 DMP Yeah.

ACDR Okay. Push the ... coming in.

11 52 06 CMP Okay. It's locked, Deke.

11 52 07 ACDR Okay, back to the right.

CMP All systems ... it says here. ...

ACDR Okay.

CMP Deke, degrade systems. ...

DMP Yeah.

DMP Okay. ...

CMP ...  
 CMP ...  
 11 53 00 ACDR SERVICE MODULE RCS QUAD ... OFF. ...  
 ACDR ..., I'll tell you.  
 11 53 22 DMP We got it at a ...  
 ACDR ...  
 CMP Deke, ...  
 ACDR Okay. ... check that DAP?  
 CMP All right.  
 11 53 54 ACDR Set for 1111?  
 CMP ... five 1's, 146, ...  
 ACDR Yeah.  
 CMP 5 NOUN [sic], push.  
 11 54 09 ACDR Yeah. ... activate the ... .. activate ...  
 Right here. ...  
 CMP Yeah. ...  
 DMP When you activate ... right in ...  
 11 54 35 CMP Deactivate the evaporator. Here let me get ...  
 ACDR ...  
 11 54 43 ACDR High-gain angles are MANUAL, WIDE; pitch, minus 18 -  
 DMP ...  
 CMP Well, any time you get to take the -  
 ACDR Pitch is minus 18 and yaw 220.  
 DMP ...  
 CMP ...

CMP Right there; right ...  
 11 55 34 ACDR ... 61102. ... and all that.  
 CMP It better ... you get ...  
 ACDR ...  
 CMP Yeah. Well, I was - ...  
 ACDR ... anywhere. ... Okay. Let me ...  
 CMP Yeah.  
 ACDR ...  
 CMP Tom?  
 ACDR Yeah.  
 CMP ... a little difference between 26 000 and 4000.  
 ACDR Okay. ... Yeah. ...  
 CMP Yeah.  
 ACDR ...  
 11 56 40 ACDR Okay. I got high-gain set. Active undocking ...  
 Okay. GUIDE RING CAPTURE light ... 55 go to the  
 active undocking ...  
 DMP ...  
 ACDR ...  
 CMP ... TSB over there.  
 CMP Right here.  
 ACDR Where? Over here?  
 CMP Yeah.  
 ACDR Got the Nikon in here?  
 DMP ...



ACDR ...

CMP How about the Hasselblad?

ACDR (Cough) Nikon, stay down here.

DMP Okay. ...

CMP ... Tom, ...

ACDR Yeah.

DMP ...

CMP ...

CMP (...)

11 58 43 ACDR Okay. ... Okay. We're going - we're going to A,  
MAIN BUS ...

CMP Ready to go into ...

DMP ...

CMP ...

DMP ...

CMP Yeah. We got to watch this ...

DMP ...

11 59 08 SFE Apollo, we are opening active hooks.

DMP ... All we have is ..., right?

ACDR (... open.)

11 59 26 SFE ... I don't understand you Tom.

DMP (We have opened the active hooks.)

SFE Okay. Open active hooks

11 59 37 ACDR Okay; 56. AUTO RCS SELECT, twelve. MNA; B/D ROLL  
is OFF, all of them - is OFF.

11 59 49 DMP Okay. I'm supposed to do a VERB 46. ...

11 59 56 ACDR VERB 16 NOUN 04 ENTER; SPACECRAFT CONTROL CMC in  
FREE ...

DMP ...

USSR Tom, interface seal compressed off.

12 00 09 ACDR (Roger, Roger.) Okay. RHC, trim R2 and R3, pitch  
and yaw to 0, fly from errors.

12 00 21 CMP ROLL, OFF.

ACDR B/D ROLL, OFF. Thank you. All of the twelve, OFF.

CMP Okay, now.

ACDR Okay.

CMP We should - -

ACDR ...

CMP Yeah. Okay, it's ...

ACDR ...

DMP That yaw there? That's roll, pitch, yaw ...

ACDR Yeah. Yaw's started.

CMP Yeah. Got a good yaw.

ACDR ... I can feel is ... roll. Boy, ...

CMP ...

ACDR Huh? Oh.

CMP ...

DMP ... great yaw.

ACDR ...

12 01 24 DMP Great big yaw.

ACDR ...

CMP Yeah.

ACDR ...

CMP Yeah.

ACDR Soyuz.

12 01 39 ACDR (Soyuz, this is Apollo. Ready. How do you read?)

SCDR We are ready for undocking, Tom.

ACDR (Roger.) ... coming up at 59. Okay. All your ...

DMP ...

ACDR Okay. Let's put - -

DMP ...

ACDR Let's put our ... in here, okay?

12 01 59 ACDR BMAG MODE, three, ATT 1/RATE 2; SPACECRAFT CONTROL, SCS; do not control roll attitude; EMS MODE, NORMAL.

DMP ... run through that again ... CONTROL - -

12 02 12 ACDR SCS. EMS, NORMAL. - -

SCDR ...

ACDR - - STATION SELECT CM/CM2; TV - VTR POWERS, three, ON.

12 02 35 DMP ...

12 02 38 ACDR Yeah. ... VTR HEAD WHEEL MOTOR DRIVE, ON.

12 02 42 CMP Okay. ... - -

12 02 43 ACDR VTR TAPE, RECORD; DAC on.

12 02 48 CMP Okay.

ACDR We'll quickly count down to it. You got 15 seconds to go.

CMP ...  
 12 02 55 ACDR Stand by to CAPTURE LATCH B. Stand by.  
 CMP Okay.  
 SCDR We are standing by.  
 12 03 06 DMP About 20 seconds ...  
 ACDR Okay, 20 seconds.  
 DMP Ready.  
 ACDR You got ...?  
 DMP ...  
 ACDR Yeah. Okay.  
 CMP ...  
 ACDR Stand by.  
 CMP Okay, it's 5 to go.  
 ACDR (Ready for undocking 5, 4, 3, 2, 1)  
 12 03 25 ACDR MARK.  
 12 03 26 SCDR We have undocked.  
 ACDR (Undocking.)  
 DMP Okay. We got about four in there.  
 ACDR Okay. CAP - -  
 SCDR ...  
 ACDR - - seconds to go minus X for 3.  
 CMP Okay, Tom. What's next?  
 12 03 39 ACDR Okay. Okay, CAPTURE lights A and B, out and LATCH  
 to down.  
 12 03 42 CMP Capture LATCH A and B, I did it. ... down, ...

ACDR All right. At 15, we're supposed to thrust to ...

DMP Are we ...?

CMP At 30, we go minus X for ...

12 03 56 CMP Now.

ACDR Okay.

DMP Okay.

ACDR We could have checked that.

CMP Okay.

12 04 11 ACDR Okay, then, at 3 minutes, we go DSE, LOW BIT RATE.

CMP Got about a 1-degree error. ... line that up on that - -

ACDR ...

CMP I don't know what it was when it shut off, there.

DMP ...

CMP In?

DMP In.

ACDR No. I got it.

DMP ...

ACDR ...

DMP ...

12 05 08 ACDR Okay. Let's go for 3 minutes. ...

DMP ...

ACDR 3 minutes. ...

DMP ...

ACDR ...

DMP ...

ACDR I'm looking for ... ..

12 05 57 CMP (Soyuz, this is Apollo ...)

SCDR Roger.

DMP ...

ACDR Coming up ...

DMP ... 3 minutes ... MAN ATT, RATE COMMAND ...

12 06 35 ACDR - - LOW BIT RATE; DAC, off; MANUAL ATTITUDE - DAC,  
off, Deke?

DMP ...

12 06 41 ACDR MANUAL ATTITUDE, three, RATE COMMAND; AUTO RCS,  
sixteen, MAIN A and B.

DMP They're all on.

ACDR ...

DMP Got it.

12 06 49 ACDR Okay. Let's go to -

12 07 06 CMP ... roll or not?

ACDR No.

CMP You eventually have to.

ACDR Eventually you have to.

CMP Because you got to go up and dock with it.

DMP Yeah.

ACDR It's easier if you do.

CMP Let's see, I guess our shadow's off of them now.

DMP ...

CMP ... where it came off.

ACDR Okay, Deke. Stand by. Plus-X for 16 seconds.  
Okay -

12 07 22 ACDR MARK it.

ACDR Okay, 8 seconds gone, 10 seconds, 13, 14, 15 -

12 07 37 ACDR 16. That's it. Stop. Okay.

CMP ... docking. ...

ACDR (Soyuz, this is Apollo. We have the Apollo station-keeping now.)

SCDR Roger. Apollo stationkeeping. What is the range?

DMP ... we're not either, Tom.

ACDR (50 meters.)

SCDR Roger.

12 08 14 ACDR Roger. We've undocked and stationkeeping.

ACDR Everything was on time, Bo.

CC-H ... AVERAGE ...

12 08 35 ACDR It's in AVERAGE, Bo.

CC-H Thank you.

ACDR Hasselblad ...

SCDR Soyuz orientation lights on.

ACDR (Roger.) They told me this morning, remember I ask ... but I ask them what setting ... 4[00] and 500.

CMP Roger.

12 09 03 ACDR You got PEAK, Bo.

CMP ... docking.

12 09 41 ACDR Bo, it's in UP TELEMETRY. Yeah, that's right. When I couldn't see that fucking docking. ... undocking ... That's right.

ACDR How's your picture on the tube, Bo?

ACDR Oh, yeah.

DMP ...

ACDR Okay, let me go ahead and ... them.

ACDR Okay. ..., Deke. ... orientation. Right after that we can - we can ...

CMP You have beacons on?

ACDR No. ...

DMP ...

ACDR Okay. We're going to ...

DMP It ... work ...

ACDR Yeah. I told him to turn it on.

DMP ... to get that in.

ACDR Okay. ... - -

CMP ... go ahead ... - -

12 10 54 ACDR Okay. PRIMARY EVAPORATOR activation. GLYCOL H<sub>2</sub>O FLOW, AUTO, and STEAM PRESS to AUTO.

CMP I don't think you have to worry about it. ... attitude, right?

ACDR No, no.

CMP ...

ACDR That's right.

CMP Yeah.



ACDR ...

CMP Yeah.

ACDR ...

CMP ... Yeah.

SCDR What is range now, Tom?

12 11 24 ACDR (About 50 meters.)

SCDR We are now 30 meters.

ACDR (50, 50.)

SCDR ..., Tom.

ACDR Say again, Bo. Keep that ...

12 11 57 SCDR What is the range now?

ACDR (...)

DMP ... No, wait a minute ...

12 12 12 SCDR What is rate now?

ACDR ...

SCDR We are now - Apollo-keeping [sic] - stationkeeping.

SCDR 50 meters.

SCDR I'm ready.

ACDR Okay, now. ... attitude. ... you got AVERAGE.

12 12 40 SCDR Soyuz ready for orientation.

ACDR (...)

ACDR Yeah, that's right. ... Okay. Okay. Let's - -

DMP ...

ACDR Okay. Let's - we're all right. Okay. Grab a couple of pictures of ...

DMP ... got any more of the film.

ACDR Not yet. ... (...)

12 13 25 CMP ... right.

ACDR ... F/4 on the 500 ...

CMP F/4 on the 500?

ACDR Yeah, that's ... That's what the ground told me.

CMP That's the ... after that.

CMP I haven't - -

ACDR ... F/4.

SFE Initiating orientation.

12 13 48 CMP (Ready ...) ...

CMP Okay. ... I - I got it down ... 500. ...

ACDR 500. F/4 500. What about the Hasselblad? ...?

DMP ...

ACDR Okay. Vance, ...

DMP Okay.

ACDR ... Set DET counting up to 96:08 ... At 55 it'll be 13 - that'll make it 47 - 13 ... 47.

DMP ...

ACDR What, the DAC?

DMP Yeah.

12 14 41 ACDR ...teen ... trying to make another ...

ACDR ... Okay. Go ahead.

ACDR 3, 2, 1 -

12 14 58 ACDR MARK. Counting up. Okay, that's 96:08, 47 and counting.

CMP Okay. ...  
 ACDR Okay. VERB 25 NOUN 22 ENTER.  
 12 15 18 ACDR Okay. Plus 197 (cough) 00.  
 CMP ...: 014 ...  
 ACDR Deke get me that ...  
 DMP ...  
 ACDR Okay. Deke has the same problem I have. The COAS  
 is completely washed out. It's full up, it's so  
 bright out.  
 ACDR We can look and ballpark it; it's about 50 meters,  
 plus or minus 1 or 2.  
 CMP Hey, look at them ...  
 ACDR Going off?  
 CMP Don't know.  
 CMP Deke?  
 DMP Yeah.  
 CMP Maybe it - -  
 ACDR Oh, that's ...  
 CMP ... Hey, Deke? What about ...  
 DMP No, I don't. ....  
 ACDR (Laughter)  
 CMP No, I - I paid for them too.  
 12 16 34 ACDR Deke's got more than 50.  
 ACDR ...  
 CMP Think I got ...  
 ACDR No, that's ... Yeah, the Hasselblad was ... Let me  
 try that upside down. Try that upside down.

DMP Okay.

ACDR Passive docking checklist. Okay, Deke. Ready to go on this?

DMP Yeah. ...

ACDR All right.

CMP Tom, you got the ...

ACDR I got - I got the ...

DMP ...

ACDR Let me have the ...

CMP ... You didn't have - -

ACDR Yeah.

CMP - - ...

ACDR (...)

12 17 43 ACDR Yeah. ... Better get your COAS ..., Deke.

DMP Well, I considered ...

ACDR It was damn good and light out ...

DMP ... COAS ... eyeball it. That COAS is ...

CMP Well, I ... - -

ACDR ... docked and coming up ... You ... alined?

DMP Yeah.

12 21 33 ACDR All right. Let me know when you're lined up. Line up on ...

IMP I got the ... alined ...

CMP I think ...

DMP I am ...

CMP Give me the docking angles again.  
 ACDR ... let me check those angles. Stand by. We're  
 real busy. Okay. 197 - -  
 CMP Yeah.  
 ACDR - - 205 - -  
 CMP Yeah.  
 ACDR - - 014.  
 CMP 14 degrees.  
 ACDR 14 degrees, 197, 205.  
 CMP Okay. ...  
 ACDR That's all I got.  
 CMP ...  
 ACDR Just line up - line up on the ...  
 CMP ... I think I can line up on the - -  
 ACDR Line up on - -  
 12 22 23 CMP I think this attitude ... off.  
 ACDR ... me off.  
 CMP Deke.  
 DM Yeah.  
 CMP ... off.  
 CMP ... it's off.  
 CMP Where we at in the ...?  
 ACDR ... You've got 1/2 GAMMA, Bo.  
 CC-H Thank you.

CMP And, Bo, we think maybe his docking attitude isn't exactly what we've got on the pad.

DMP No, it's not.

ACDR We know it's not, Bo.

CMP Roll looks good. Pitch and yaw are a little off.

ACDR Okay. Take the mags ... out.

12 23 08 SCDR Tom, APDS mode accomplished.

ACDR (Say again, please.)

SCDR APDS mode accomplished.

ACDR (Roger. Roger. Understand you.)

CMP I'll give you our docking attitude as soon as we have it refined here.

ACDR ...

SCDR Everything is ready.

ACDR ...

ACDR Well, that's everything.

DMP ...

ACDR Okay. ...

CMP Yeah. Just so it'll guide right ...

ACDR Yeah.

CMP Either your right ... or I'll take a ... Right ... you got a good attitude.

ACDR Yeah. ... looks good.

CMP Okay.

ACDR ...

12 24 14 CMP Okay, Bo. We're pretty close. The docking attitude is 195.7, 208.1, and 21 degrees point 3.

ACDR Okay. Let's put ...

CMP Deke has ...

ACDR Huh?

ACDR Okay. ... lined up on the ATS.

DMP Yeah.

12 24 58 ACDR (Soyuz, this is Apollo. Orientation established. Ready for docking.)

SCDR Okay.

ACDR (Roger.)

SCDR We are ready. Go ahead, Tom.

ACDR Roger, Alexey. (Understand.) All right. I think they're ready to do it.

CMP Yeah, but we got to - -

ACDR Okay, here they go.

CMP - - NORMAL.

ACDR Okay. Got the DAC on; EMS MODE, NORMAL.

12 25 40 CMP ... DAC on.

ACDR Okay. It says thrust, thrust plus X for ... seconds. ...

CMP 4 jets.

ACDR 4 jets, yeah.

CMP Not 4 jets. ... jets ...

DMP ... DAC ... out.

12 26 37 ACDR Okay. Why don't you get the DAC film ...

CMP ... can't make it in here.

ACDR Well, whenever you run out.

DMP ... can't make it ...

ACDR ... is okay. You're supposed to be starting way out there ... when ...

CMP ... you go ahead.

ACDR Okay. Let's try that.

DMP Let's get ...

ACDR ... I got ...

DMP ... you up on it ...

DMP ... washed out.

ACDR ... they're all up there. Okay. I'm going to give them a call.

CMP ...?

ACDR Yeah. (Soyuz, I am now approaching Soyuz. We are ready.)

SCDR I don't understand you. Repeat it, Tom.

DMP This where you want ...

12 27 34 ACDR Yeah. (I'm approaching Soyuz.)

SCDR Okay. Keep coming, Tom.

DMP ... COAS ...

ACDR All right. All right. All right, line up - line up his target, Deke. Look at the target. Line that up and put that ...

ACDR Hey, Deke - -

DMP ... go ahead - -



ACDR - - look for ... - -  
DMP - - ...  
CMP ... everything else, the bottom's right.  
ACDR ... film ...  
DMP ...  
ACDR ...  
ACDR Deke.  
DMP Yeah.  
ACDR Line up just ... Half of ... That's about right ...  
COAS.  
DMP ... bright light for ...  
ACDR Line up the ...  
DMP ...  
ACDR ...  
DMP ...  
ACDR Ready. ...  
12 28 50 ACDR Okay, Houston. Deke's having the same problem with  
COAS washout that I had.  
DMP The COAS is ...  
CMP Yeah.  
DMP ... absolutely zero COAS.  
ACDR (Distance 30 meters.)  
DMP ...  
ACDR Vance, see ...  
DMP ...

ACDR ... that panel, that ... panel ...

CMP Yeah. Looks to me like it's a pretty good guess as to what ...

DMP Yeah.

ACDR ... get that - get ... light ...

DMP ...

ACDR Aw, you're all right.

CMP We got confidence.

ACDR We got confidence in you.

CMP ...

DMP ... Have any problems ...

CMP Well, that's bet - that's better.

ACDR ...

CMP No. I don't know what setting you're on.

ACDR I tell you, ...

12 30 23 CMP (Distance 30 meters.)

DMP I don't know ... Yeah, ...

DMP ...

ACDR Okay. Now I can - I can see his ... now real good, Deke. Vance, slow it up a little bit.

CMP Yes, I can ... that.

ACDR ... out here in ...

CMP ... Okay; I'll watch ...

CMP Okay. Struts?

DMP Okay. ...

ACDR Every - everything is done.

CMP Okay. It's been done. As soon as we dock, what then?

ACDR Soon as we dock - Okay, I'll tell you. Oh shoot! It's not ...

DMP ...

12 31 20 ACDR ... dock, contact, plus X ... for 5 seconds. MAN ATTITUDE, MIN IMPULSE.

DMP That's right.

12 31 32 SCDR We confirm ...

CMP (...)

ACDR Okay, Deke, coming on his ...

ACDR Oh, shit.

12 31 48 SCDR 50 meters.

ACDR ... pole. See, he pitched down and ... the Earth.

CMP Let's go ...

DMP I didn't hear you, Tom.

12 32 05 ACDR Okay. This COAS isn't going to be worth a ...

12 32 19 CMP Yeah, well you're going awfully slow.

ACDR You're going awful slow, Deke.

ACDR From my position we're getting close. I can't tell you about that target because of my angle.

↓

CMP Yeah.

ACDR You've got good enough - you're in good enough position  
for a capture right now.

CMP Yeah.

ACDR Vance, you ... left and right.

CMP Yeah. I'm in good shape ... right now. He can see  
that pretty well when ... turning around. ... a  
little bit low.

12 32 43 ACDR You're going up.

DMP Still ... a little high ... No, no I'm not.

CMP No you're not, are you?

ACDR Let Deke do the ...

CMP I don't want ... Right.

ACDR Close your rate; slow her down. ...

CMP There you go.

CMP If we get in the way. ...

ACDR Damn sure.

CMP Okay. I'm watching the light. ... your right  
hand. ... I'm looking for the ...

ACDR ... Yeah. I'm looking for the light. Maybe slow  
it a little bit.

CMP Okay. You want to watch for the light.

ACDR I'm watching for the light. Stand by. ...

CMP Stand by. ...

12 33 44 CMP Capture.

12 33 45 ACDR (...)
   
USSR (...)
   
12 33 49 ACDR Yeah, that's got it. Got it.
   
CMP Okay. ... Go ...
   
ACDR Okay. MIN IMPULSE.
   
12 33 51 CMP MIN IMPULSE. I got it. Beautiful!
   
DMP Couldn't have been lined up any better.
   
CMP Good, Deke. That's great. Hey, (whistle).
   
ACDR That's okay. ... That's okay. Just ... He scared
   
the shit out of me too. That's all right. He's got
   
some real weird dynamics. He's got some weird
   
fucking dynamics.
   
CMP Yeah.
   
ACDR Just let it go.
   
CMP Yeah. That whole docking - -
   
ACDR Oh, fuck! Do you see him? Watch him ...
   
DMP What you can do on that - that ... during the docking
   
period. ... that COAS. ...
   
ACDR You better believe it is.
   
MS Okay, now.
   
ACDR Okay. We have - -
   
CMP All right.
   
12 34 30 ACDR Okay. We got the lights just exactly as we're sup-
   
posed to have them.
   
CMP That's right.
   
DMP Yeah. Don't forget the ... here.

12 34 43 SCDR Apollo. This is Soyuz. ... initiating retraction.  
 CMP (...)  
 ACDR Okay. That - Okay.  
 DMP Let's - I have to get ...  
 MS ...  
 ACDR All right. I'll be ...  
 CMP All right. It's not hurting anything.  
 ACDR Not hurting anything. You're at MIN IMPULSE.  
 CMP ... at MIN IMPULSE.  
 ACDR You're at MIN IMPULSE. Not hurting a thing.  
 CMP Okay. Deke, suppose I ... retraction ...  
 DMP All stable now.  
 ACDR Okay. MANUAL ATTITUDE, three, MIN IMPULSE, which  
 you got. AUTO RCS - -  
 CMP No, I don't have. I don't have.

12 35 15 ACDR Didn't you go to MIN IMPULSE?  
 CMP No. No.  
 ACDR MANUAL ATTITUDE, three, MIN IMPULSE?  
 CMP No. I can't worry about ...  
 ACDR You were CMC in FREE ... MIN IMPULSE.  
 CMP Okay. ...  
 CMP It stopped. No. By God, it is yawing.  
 DMP Going into gimbal that was causing it.

CMP Yeah. I'd try the hand controller.  
 ACDR ... what I'd try.  
 DMP ...  
 CMP Gimbal up. Yeah. Pitch down. Pitch down.  
 ACDR Hey, your CMC in FREE ought to be AUTO.  
 12 36 36 DMP CMC, AUTO. Okay. ...  
 CMP Pitch down.  
 DMP ... yawing.  
 CMP Now, try to get back over here ... Yeah, ... catch up with you.  
 DMP Okay.  
 USSR ...  
 ACDR What the hell happened?  
 DMP ...  
 CMP Yeah.  
 USSR ...  
 12 36 50 ACDR Yeah, I'm pitching full up.  
 USSR ...  
 ACDR What the hell happened? We got some weird - -  
 USSR ...  
 CMP I don't know. It could have been from the docking there ...  
 ACDR Watch the way - his dynamics were going back and forth.  
 CMP Okay.

ACDR AUTO RCS SELECT. Okay, these - these numbers are  
OFF. A3 - -

12 35 30 CMP They're OFF, huh?

ACDR That's - -

CMP That's hand control.

12 35 33 ACDR I'm sorry. Shit. CMC in FREE.

CMP ..., Deke. Put these back in AUTO because I don't  
think that we got ... Okay?

DMP Okay.

ACDR CM - You got FREE, got that?

12 35 48 DMP Yeah. CMC, FREE.

ACDR All right. Okay. A3?

ACDR Okay. You have the jets off. A3?

12 35 53 CMP A3's coming OFF.

ACDR C4.

12 35 55 CMP C4.

ACDR B3. Quick.

12 35 56 CMP Yeah.

ACDR D4.

12 35 58 CMP Okay. Go to CMC, AUTO, real quick. ... gimbal  
mode.

DMP I know. That's what I'm worried about, here. ...  
get that son of a bitch.

12 36 08 DMP DAC going off.

CMP Let's see. Have we got everything? We got all of  
the thrusters.

DMP ... I think it's still yawing.



DMP Okay. We still got some cleanup here.

12 37 48 ACDR Yeah. After he tells us passive docked configuration, we'll have everything else done, right?

DMP Okay.

CMP Guess.

ACDR The final passive docking configuration. Everything else is done.

DMP Okay. My hand controller should still be armed?

ACDR Well - -

CMP I'd leave it armed - -

ACDR THC?

CMP - - but not turn on the THC and - -

DMP Yeah, I'm going to turn that off.

CMP I'd turn off that and leave the hand controller armed, so that you could get it in a hurry if you - -

12 38 10 ACDR Okay. Let's go. P00.

CMP We're in P00.

DMP Okay. We were getting into gimbal out there, Bo, for some reason. So we had to manually crank it out of there. ... in some weird attitude right now.

ACDR Okay. VERB 44 ENTER.

12 38 31 CMP VERB 44 ENTER.

ACDR Load 87, 1111, 00146, all balls.

CMP Okay.

12 38 50 ACDR Next one, 05000, 00050.

CMP Okay.

ACDR Okay. VERB 45 ENTER. Activate the docked DAP.

12 38 56 CMP Okay.

ACDR RHC 2, LOCKED. That's your choice.

DMP ... lock it now ...

ACDR THC, locked.

12 39 04 CMP Yeah.

ACDR EMS FUNCTION/MODE, OFF/STANDBY.

DMP Okay. That's the kind of stuff that helps.

ACDR MANUAL ATTITUDE ROLL, MIN IMPULSE.

12 39 14 DMP ROLL, MIN IMPULSE.

CMP PITCH and YAW, RATE COMMAND.

12 39 17 DMP Yeah.

ACDR LIMIT CYCLE, OFF.

12 39 20 DMP OFF.

ACDR DEADBAND RATE, MIN and HIGH.

12 39 24 DMP Okay. DEAD - RATE - HIGH.

ACDR THC POWER, OFF.

12 39 28 DMP POWER, OFF.

12 39 29 ACDR RHC POWER in NORMAL number 2, OFF. RHC POWER DIRECT 2, OFF. BMAG MODE, three, RATE 2. MAIN BUS TIE, OFF. They're coming OFF.

12 39 44 ACDR AUTO RCS ROLL SELECT, A/C ROLL, we got four MNA; and B/D ROLL, four, MNB.

CMP Deke.

ACDR Yeah.

CMP Give me those again? A/C ROLLs all up to A and B/D ROLLs all up; and I think he's going to have to turn OFF - -

DMP B/D ROLLs are all in A - -?

CMP Yeah.  
 DMP B/Ds are all what?  
 CMP A.  
 12 40 07 DMP All A. ...  
 CMP Yeah. ...  
 ACDR COAS POWER, OFF.  
 CMP How about PITCH and YAW, Tom? You want those ...  
 docked DAP.  
 ACDR Okay, now, what I called - -  
 SFE Apollo, Soyuz ...  
 ACDR Okay. It says AUTO RCS SELECT - -  
 ACDR That's all it says - -  
 SFE Apollo, this is Soyuz.  
 ACDR ...  
 CMP Okay ... - -  
 12 40 36 SFE Interface seal compressed.  
 ACDR Okay. Roger. Understand you.  
 SFE APD - APDS mode accomplished.  
 CMP We got our ring lights there now?  
 12 40 48 ACDR Yeah. Everything's squared away.  
 CMP Light - -  
 ACDR That STRUCTURE RING CONTACT light ...?  
 ACDR ...  
 12 41 04 CMP Okay. You're going to disable them - -

12 41 55 CMP I wonder if that ... maneuver ... docking attitude -  
docked attitude.

DMP I don't know. ... another attitude.

CMP Yeah.

ACDR Yeah.

ACDR Okay. Yeah, I got that ... degrees ...

CMP Well, good show, Deke. Do you have any trouble at  
it at all?

DMP No. ...

MS ...

ACDR Being - being in an inertial attitude like that ... ?

12 42 42 DMP ... pretty good ... that black background there ...  
came out ... blend right into the black, though. ...

ACDR Yeah. We're burning up in here, Bo.

ACDR It's a little hot with all the cameras on.

DMP ...

12 43 23 ACDR Well, when we went to the - when we went to the docked  
attitude, that's - that's the attitude; go back to  
that.

CMP All right ... go back to that ...

DMP Yeah, it's docked ...

CMP I'd guess ... vacuum.

DMP ... We'd better do that, I think. ...

CMP ...

12 44 02 DMP Looks like we're supposed to be in a docked attitude.

CMP I don't know. You want to ask, Deke, ... and see what  
they say?

DMP Houston, Apollo.

DMP Yeah, we're in some random attitude here, due to getting into that gimbal lock situation. And we're debating whether to maneuver back to the docked attitude or leave things go. What's your recommendation.

DMP Okay.

ACDR I can go and get that hatch, yeah. ...

ACDR Yeah. Whoops!

ACDR Well, let's see - Yeah, it's going to be ... on ... Yeah. Oh, by the way, you won't have to ..., you know. ...

CMP Yeah. ...

CMP Okay. Roger. ...

ACDR ...

DMP I'll be all right.

12 45 19 SCDR (Moscow, Soyuz. Do you read me?)

CMP You think he's had too much to drink? (Laughter)

M-MCC (Read you loud and clear. How do you read me?)

SCDR (Everything is nominal. We had an integrity check. 3 minutes passed, the pressure has not changed; that is, it varies in normal limits. For the last 3 days, we have such trouble - When we are flying over the Soviet Union territory, they begin to transmit the weather reports from the airports ... We get all of it. As soon as ... docking and undocking, the noise starts.)

ACDR ...

SCDR (...)

DMP You haven't heard from Alexey yet, Tom?

ACDR Oh, it's too early ...

12 46 47 CMP Okay, the three power switches are off. ...

ACDR I'm going ahead - I'm going up - I'm going to go up and get that hatch out.

CMP Yeah, I think you ... Yeah, it looks like - -

ACDR No. No, I don't ...

CMP Yeah.

ACDR ...

12 47 26 CMP Yeah. You're right, Tom. Yeah.

ACDR Well, I guess ... dock because it's late. Looks like we've been stood up.

USSR (...)

CMP ...

USSR (There is nothing besides audio equipment. This is the third day that the magnet is being overheated. The landing course is 194 degrees, the temperature is 27 degrees, humidity 43. That's what is constantly being transmitted. ... SIMPLEX and VHF. We have SIMPLEX AM and dual VHF on.)

ACDR All righty. (...)

USSR ...

ACDR Start it, Deke.

12 48 13 DMP Yeah.

CMP ... huh?

ACDR It's supposed to be ...

DMP I'll tell you one thing ...

CMP ...

DMP ...

CMP Yeah. It looks like ...  
 ACDR Going over Russia?  
 CMP Yeah, probably ...  
 12 49 30 CMP I wonder if that's that ...  
 DMP ...  
 CMP ...  
 USSR (...)  
 DMP ...  
 USSR (Come on, speak.)  
 CMP We'll just leave that hatch ...  
 ACDR Yeah, well - -  
 USSR (... Orroral from 12:43 to 12:49)  
 12 50 24 ACDR Take down the hatch, Deke. ...  
 DMP Okay; will do it ...  
 ACDR That's right. Put it down and hold the hatch down.  
 DMP Okay.  
 ACDR ...  
 DMP All right.  
 CMP I guess we can probably get that damn black bag out.  
 ACDR Yeah.  
 CMP ...  
 DMP That is a good idea.  
 CMP May be ...  
 ACDR ... Get that black bag up in the docking module.

12 51 07 DMP That's a good idea. ...

DMP Why don't we ...

CMP Tom, we want to get a reading after undocking. ...

ACDR ...

CMP Oh.

DMP Soyuz, Apollo.

SCDR Go ahead.

DMP (Alexey, ...)

SCDR I don't understand you, Deke.

DMP (...)

SCDR Go ahead. Okay.

12 51 51 ACDR Put that black bag up there, too, will you.

ACDR ... I turned on the mixing. ... I'm going to turn on that fan up here, too.

DMP Whew! That's warm.

ACDR Yeah, sure wish we could - -

CMP Looking back, I wonder if we got information on it?

ACDR No, it didn't.

DMP ... I don't know, I feel like maybe ... trouble on this thing.

ACDR I'm going back ...

DMP Okay, - -

ACDR I'll take a ...

DMP ... a little earlier.



ACDR Vance?

CMP Yeah.

ACDR ... pitch ...

CMP Eight, what?

ACDR Yaw.

12 52 35 CMP Yaw. Okay, that's the ...

12 52 42 ACDR ... on the way out.

13 05 52 CMP We got one whale of a reading.

ACDR Roger. And, Bo, again, you wanted the helium inject at this time, right, at 96:40?

ACDR Okay. That's page 7-3 in the DM Checklist.

ACDR Okay. Roger. 7-5; 7-5; 7-5; 7-5.

13 06 40 ACDR Glad he got that - glad he went ahead and got that out of there on time.

ACDR Okay. Got the - got the OPTICS at ZERO?

13 07 15 CMP Yeah.

ACDR ...

CMP ... pretty close to nominal.

ACDR ... right on top of ...

CMP Yeah.

13 08 56 ACDR Okay. ...

CMP Yeah.

ACDR No, if you don't have it, then don't put it in.

13 09 04 CMP Okay. ...

ACDR Pardon me?

ACDR All right, I'll get it. What was the temperature?

CMP Yeah.  
 ACDR Huh?  
 ACDR Is that the ...?  
 CMP Yeah.  
 ACDR Is that the ...?  
 CMP Yeah.  
 13 10 20 CMP Oh, good. Hey, this is ... Tom, want to see some-  
 thing ...  
 ACDR Oh, yeah, that's ...  
 CMP Hey, Deke, ... this ...  
 (Music)  
 CMP Oh shit!  
 ACDR What?  
 CMP I got dirt all over me! The lid was off, and I  
 pulled it off, and the damn thing -  
 ACDR The lid was off?  
 CMP Yeah.  
 13 11 18 ACDR Want a towel?  
 CMP No, I'll get a ...  
 CMP I know it; I was trying to take it off.  
 ACDR Oh, I see. Yeah.  
 CMP ... more difficult.  
 CMP ... pardon my quick reaction.  
 ACDR All right. ...  
 CMP Yeah.

13 12 00 DMP Did you mount that bracket and penlight, Tom?

ACDR Yeah.

ACDR ... all day today ...?

CMP ... A3.

ACDR Can I help you on that?

CMP Oh, I'll have this ... in a couple of minutes.

USA (Music)

13 13 35 ACDR ... Listen to ... sing.

USA (Music; singing)

CMP (Laughter)

13 15 26 ACDR Hot dog! ...

CMP Hey, say, you ought to let them hear it.

ACDR Yeah. Get the one with the showers too. The girls in the shower.

CMP I've got a whole pocketful of good Russian stuff. Stuff - ordinary - respectable stuff.

ACDR Yeah.

CMP Yeah.

DMP Yeah.

13 16 00 CMP Okay.

ACDR Okay. Hold it. Want to get that ... bag? Let's see, this is the fifth day. But why don't ... Is that bag full?

ACDR Yeah, but we want TSB. Why don't we take that TSB. ...

CMP TSBs, though, don't hold much. I think we ought ...

13 16 48 ACDR Okay. Let me ... I know where the other one is ...  
... the very bottom of U-2. It's in the bottom part  
of U-2. ...

ACDR Hey, yeah. ...

13 17 52 CMP Hey, Tom.

ACDR Yeah.

CMP ..., but let's play this one first.

ACDR Yeah.

ACDR ... is the mike on - in here.

13 18 54 CMP Yeah. We've got to have one of them for ... to keep  
the balance right up there. ...

ACDR ...

CMP Yeah.

ACDR ... let me have that tape and I'll rewind it and put  
it on ...

CMP Yeah. Well, I thought we would wait for ...

13 19 32 CMP All right. Fine ... Tell you what we can do; we  
can use one of them for trash, Tom, and when it came  
time to jettison, we can try to stow a couple of  
TSBs in the - put it wherever we could - locker or  
anything else. If we could keep the bag of solar  
research stuff, ... trash ...

13 20 13 DMP We need a new battery, Tom.

ACDR ... Deke.

CMP Yeah.

ACDR ... that didn't work ... did it?

CMP No, no. You've got to rewind it. No, that Carole  
King is on the other side, Tom.

13 21 10 ACDR Oh. I put the right side up, I thought.

CMP It's the number 2 side - got to be up.  
 ACDR Right.  
 CMP Anyway, that plays ...  
 ACDR ... Carole King ... upside down.  
 CMP I ... setting up the ..., but I could do that.  
 ACDR Going to do that. Okay. Want me to help you on that, Deke?  
 13 22 13 ACDR That's the last one we got. Big ones? Got two ... last one. ...  
 CMP I still think it's ... cause Deke ...  
 ACDR ...  
 CMP Oh, yeah.  
 SCDR Apollo, Soyuz. How do you read me?  
 ACDR (Excellently, excellently.)  
 13 23 04 SCDR Pressure integrity of Soyuz and interface volume is okay, Tom.  
 ACDR (Roger.)  
 CMP Well, let's see now ...  
 USA (Music)  
 ACDR Here you are.  
 ACDR (Soyuz, Apollo.)  
 SCDR Go ahead.  
 ACDR (... this is Russian music.)  
 USA (Music)  
 13 24 09 ACDR (Do you hear well?)  
 SCDR Very good. Well. Go ahead.

USA (Music)

CMP Okay. I guess ...

ACDR Oops. Sorry ...

ACDR (... of the launch configuration.)

13 24 42 CMP Hey, do you want to go up?

ACDR See the black bag up there? Let's get those things down.

CMP Okay. Tom. I got one of these - these - -

ACDR Where do you want to put them?

CMP How about in here?

ACDR We got the - got the big black bag ...

CMP There you are.

ACDR ...

CMP Yeah, that's okay.

ACDR Okay, the big black - -

CMP No, no wait a minute.

ACDR ... that's what it is.

CMP Yeah. Yeah - I guess so.

13 25 40 ACDR Just think about ...

CMP It depends on how long we have to leave it. It - ... go down.

13 25 47 ACDR Yeah, it ...

CMP Well, ... may be ...

ACDR Got it on.

13 26 36 CMP Okay; go on through, Deke.

CMP Huh?

DMP ... okay.

CMP All right.

CMP Well, first we got to do these things right now. Why don't you get this battery out, and - as soon as I get the battery I'll be able to ... Hey, Tom, you don't need to ... the battery ... pulled them out.

13 27 24 CMP Hey, Tom. Suppose you can make the food.

ACDR Sure will. What're we having?

CMP I don't think ... snack.

13 27 53 CMP Return to A3.

CMP Battery. Got it?

ACDR Yeah.

13 29 39 ACDR Got the - got the food all cooked up.

ACDR Okay, Vance. The wheel's at A3.

13 37 17 ACDR Did you get done?

TIME SKIP

14 36 07 CMP Yeah. Okay.

ACDR Ah-ha. I brought - I got this Conway Twitty, and we'll wait and put it in - in the one that was ... and put it in ...

CMP Yeah. Well, I don't think - No, I didn't think it was a song. I didn't think was a song ...

CMP Okay.

ACDR ... We may not have it.

ACDR Okay. ...

ACDR How about that. (Laughter)

14 38 20 ACDR BMAG MODE, three, RATE 2. This is after docking; after we've loaded the DAP. I have it checked off. RH 2 POWER DIRECT 2, OFF, and RHC POWER, OFF. BMAG MODE, three, RATE 2. I have it checked off. ... verify. AC ROLL, MNA, B/D ROLL ... COAS POWER, OFF. ... do much from that angle - looking down at those pictures from that angle, doesn't look like ...

CMP ...

ACDR We got Orroral Valley here coming up right now.

CMP Okay.

ACDR Okay. Now let's go to this undocking attitude. I have to hit a VERB 49.

CMP Okay. ... what we got here.

ACDR All righty. Here's the new attitude. Plus 02600, plus 30700, ... Everything is checked. Plus 02600, plus 30700, ...

ACDR Okay.

CMP ...

ACDR ... maneuver 10:05, 98:35. Want to do it over?

CMP (Soyuz, this is Apollo.)



SCDR Go ahead.

CMP (Alexey, we are beginning the maneuver.)

SCDR Go ahead.

ACDR Okay. Now ... Okay. ... get an update ...

CMP Okay. We're getting to Orroral Valley right now.

ACDR ...

CMP ...

ACDR ...

CMP ...

ACDR High-gain angles. Pitch, yaw, okay. Plus 03 - oh, here's - plus 33, plus - -

CMP Yeah. We need to get one bag there, Deke. All you have to do is take it out, use it as is and then stow it back there. But make sure that you got the valve closed and everything ... And, then later ... dump. Huh? Okay. We got a pass over Orroral Valley. He's going to explain a few things. See what he says.

CMP Yeah. They're kind of hard to put on. They have to go into the reset ...

14 42 05 CMP ... I - to tell you the truth, never used one, Deke. That's how the big boys told me. ...

ACDR ... Look there, Deke.

ACDR ... You got to use the pressure, too. ... It's uncomfortable, I'll tell you.

CMP Actually, you have to open the valve to take a leak, then close it.

ACDR Open it ...

CMP ... leak it out later.

ACDR Open when the valve is parallel to the line of flow.

14 42 37 ACDR I've never liked them. You just - you always ... because you can't get enough ... to see the ..., and you muff the whole thing.

CMP Oh, no. I think ... That's okay. (Laughter) I'd like to ...

CMP Incidentally, Deke, when you put that bag in the ..., and I'll probably - both run up there and see ... When you put that back in there. My T-shirt's in the bag. Give it to me then ... but not - no hurry.

ACDR Okay; we've maneuvered to the altitude ... Orroral Valley. We want to get ... Orroral Valley at - should be here now.

CMP Yeah; any minute.

ACDR Let me tell you, one thing you need to do is to tweak up that volume.

CMP ...

ACDR Yeah. But do that first. ... I got it. Got it. That - that was an option - that was an option 1, right?

CMP Sure hope we're facing the Earth. Option 3.

ACDR We got an option - Oh, we did an option 3; we need an option 1.

14 44 50 CMP We did the option 1.

ACDR Okay.

CMP ...

ACDR Yeah, but it gives you an option 3 down ...

CMP That was R-4.

ACDR Okay. Yeah.

14 45 54    CMP        Need a ...

             ACDR        Yeah.

             CMP        Get the other one; 42. And I won't torque until we talk to them.

             ACDR        Okay. We got contact now.

             CMP        Okay.

             CMP        Okay. We're ready to torque.

             ACDR        Okay. Torque 39?

             CMP        Yeah. But I won't.

             ACDR        ... minus 87.

             ACDR        Hello, Houston, Apollo.

             ACDR        ...

             CMP        ... plus - minus 87. Oh, I see. Plus 35, plus 78, minus 87.

             ACDR        Hello, Houston, Apollo through Orroral.

             ACDR        ...

             ACDR        ... never came up.

             CMP        Okay.

14 47 39    ACDR        This was - this must have been a real low pass.

             CMP        Yeah.

14 47 41    ACDR        We'll start the torque later.

             CMP        Yeah. Deke, ... torques.

             DMP        ... going to torque at 27:45.

14 48 09    DMP        I hate to say it, but that God damn bag ...

             CMP        Is that right?

ACDR ... back pressure ...

DMP No, and I didn't put it in ...

ACDR Yeah. It usually is pretty clean that way.

DMP ...

CMP Hey, Tom. Do we have any other stations ... ATS before we undock?

14 48 34 ACDR Okay. Orroral ... Oh, yeah. We've got Quito, Ecuador, and we got ATS. Ecuador and ATS. ... quite a bit. Okay. We got 30 minutes until ...

CMP Maybe Quito would be a good place to do it.

ACDR What's that?

14 48 58 CMP Then - it'll be at least - wondering until they get the ATS. That's ...

ACDR Yeah.

CMP Okay. That's all finished. I'm going to go up and change clothes about now.

14 49 30 ACDR How about putting this stack of ...

DMP ...

CMP I thought you were going to say you're going to go up into the DM.

ACDR Oh, I might get - I might try that too. ... I would say the pressure ... back pressure ... with each one. ...

14 50 07 CMP Anything going on the Flight Plan today?

ACDR No. We - we did that - we did it early, you know.

CMP Yeah.

ACDR ... I've got to turn on the VHF ...

DMP It'll be about 30 ...

ACDR      Okay. ... Okay. Okay; ... and all that free torqu-  
ing and all that ...

CMP      Yeah. Okay.

ACDR      We'll have to do another VERB 49 from this angle.  
Yeah. Hit a VERB 49 ... .. Okay. ... 26 307,  
... 00. Okay. Okay.

DMP      Okay. Now what do I do? ...

ACDR      Okay.

14 52 20    ACDR      Okay. Now we go to a P20. Okay. It's - it's 98:30.  
... I'll ... It says P20, option 5, quad C ...

DMP      ...

ACDR      Yeah. Okay. ...

14 53 03    DMP      Okay. ...

ACDR      Okay. ...

14 53 36    ACDR      Okay.

14 54 18    ACDR      Vance, don't start the P20. We don't do it yet.  
NOUN 78, plus 30 ... plus three zeros ... 47 ...  
Okay, Vance. ...

14 55 31    SCDR      How do you read me?

ACDR      (Good, how do you read me?)

SCDR      I read you loud and clear. Just now, Valeriy  
Kubasov and me are in descent vehicle.

ACDR      (Roger.)

CMP      (How are you?)

SCDR      Thank you. Very well. As always.

14 55 57    CMP      (Yes. Good man. Fine fellow.)

14 56 04    ACDR      Okeydoke. ... attitude ... squared away for awhile?

CMP      Yeah.

ACDR ... checklist, here. We got - we got Quito coming up down here at 54.

CMP ... tape recorder, there?

ACDR Yes, and it's all set to go. I'll be back in a minute. I just wanted to ...

SCDR Vance, what is the best time of your working day today?

CMP (How long we ... module?)

ACDR The best time, he said.

SCDR You don't understand me. I ask you, what is the best time of your working day today?

CMP (Today?)

SCDR Yes.

CMP (Laughter) What's the best time? (Yes, I want to say, I will think about it and ...)

14 57 05 SCDR I see.

CMP Let's see. What the hell. Well, let's see.

SCDR Do you like ... day?

CMP (...) Alexey, do I like what?

SCDR ... day?

CMP (I think that, today, the docking was very interesting.)

SCDR You are right. ... solar eclipse experiment.

CMP (Yes. This - this experiment was it ...?)

SCDR I believe.

CMP (Okay.)

SCDR ... from the ground.

SCDR The ultraviolet experiment will be a good experiment.

CMP (Yes. ... very important.)

SCDR Yes.

14 58 36 DMP ... in the Flight Plan about your ... camera? ...

DMP ...

CMP No, I don't know of anything. I - I don't think in practice we ever had any of that ... turning that on and off.

DMP ...

14 59 21 CMP ... to go.

DMP ...

CMP Maybe I'll ... It'd be nice to have some, though. ... I wonder if we just ...

DMP ...

14 59 35 CMP Yeah. I - I think we ought to do it on our own if we can - -

DMP Yeah.

CMP - - do it without lousing up something else.

DMP ...

CMP Good idea. Okay. We'll need the Hasselblad in there.

DMP ... let's see ...

ACDR After you torque, while you're up there, I'll need another VERB 49, you know, because ... angle ...

CMP Oh, okay.

15 00 18 CMP (Soyuz, Apollo.)

SCDR Go ahead.

CMP (See the horizon? It's a beautiful sight.)

SCDR Let's see. Very nice. ...

CMP (Yes. ... of course.)

ACDR (Do you understand) pretty good?

15 00 57 SCDR Yes, sir. Of course. Of course.

DMP (Laughter.)

CMP (Of course, it is Russian - -)

15 01 05 SCDR Oklahoma language is the same as Russian language.

MS (Laughter)

ACDR (Yes.)

SCDR Very difficult for everybody.

MS (Laughter)

CMP (They speak very slowly in Oklahoma.)

SCDR Like Tom?

CMP (He talks fast - faster.)

SCDR ...

CMP (Did you understand the words of the ...)

15 01 46 SCDR Yes. Of course. Vance, I'll tell you, the FE said, "Alexey, do you understand Tom?" I said "Of course." But I don't understand. I wait to hear something about ... if I hear. But I don't understand Tom.

ACDR/DMP (Laughter)

ACDR No, that's a problem.

CMP (It's very good to fly together in space, isn't it?)

SCDR Very excellent.

15 02 38 SCDR It is necessary to fly in space together with our wives; I believe after this ... are going to understand each other.



MS (Laughter.)

CMP (That's very correct.)

CMP And when it's not possible to under - understand women.)

15 03 28 CMP Okay. It's getting about time to - -

DMP Okay. 99 - -

CMP (...)

SCDR Go ahead.

CMP (Alexey, please turn the ranging on.)

SCDR RANGING, ON.

CMP (Roger.)

15 03 54 ACDR Okay. VHF A, OFF.

CMP A, OFF and B to DUPLEX. RANGING, ON. Okay. ...

DMP ...

DMP ...

CMP Nope. Gosh darn.

DMP Maybe you hit the RESET.

CMP No.

DMP (Laughter)

ACDR Okay. Set the DET counting up to the undocking pad time. Okay. Now, we think it's going to be 99:07.

DMP ...

ACDR Okay. All right. Let's go to the passive undocking checklist ...

15 04 52 SCDR Preparing for undocking.

CMP (Yes.)

ACDR We got ... DELTA-V SET.

DMP There's something wrong here. ...

CMP Maybe it's because we're too close, Deke.

ACDR If you're too close, you get kind of harmonics and all that.

CMP Better turn it off, maybe ...

15 05 18 ACDR Turn it - I'd turn it off and leave it closed. Are you out of film on that film pack, Deke?

DMP Yeah.

ACDR Well, there must be ... film pack. ...

DMP ...

ACDR Yeah. But we - we got - we've got - we've got some color exterior, though ...

ACDR Well, any bandolieros [sic] up here? After this ...

CMP You guys each have your urine bag - -

15 05 47 ACDR ... forward in the fucking whole edition.

DMP Well, the only thing is, Tom, we've already got six ...

ACDR Yeah. I think it's great. Just pick yourself ...

DMP ... forget this ...

CMP Yeah.

15 05 56 ACDR That's right. But why don't we just - That's got more priority than the other thing.

DMP (Laughter)

CMP I - I still think we ought to ask Houston if they can suggest a mag and then - -

ACDR All right. If we don't, we're getting fucked whether we ... or right.

15 06 18 ACDR Okay. Let's go through these. Hatch 3, CLOSED. Hatch 3 PEV, CLOSED; I sure hope so. EMS/MODE, DELTA-V SET to STANDBY, ... Okay. Delta-V<sub>C</sub> to minus 101.3 - pardon me - to plus 101.3. Got it? EMS function, DELTA-V.

CMP All right.

15 06 36 ACDR RHC POWER number 2, AC/DC. Got it? RHC POWER DIRECT 2, MNA/MNB, right? SPACECRAFT CONTROLS CMC, HOLD, verify.

DMP ... going to verify this. This - -

15 06 50 ACDR Well, we went back to AUTO after we did the VERB 49. We tweaked it up, Deke. MANUAL ATTITUDE, three, MIN IMPULSE. DEADBAND/RATE, MIN and LOW.

15 07 02 DMP Okay.

ACDR BMAG MODE, ATT 1, RATE 2.

15 07 05 DMP ...

ACDR Okay. THC POWER, on.

15 07 10 DMP On.

ACDR COAS POWER, on.

15 07 12 DMP On.

ACDR RHC number 2, LOCKED.

15 07 15 DMP RHC 2, LOCKED.

ACDR THC, ARMED.

15 07 20 DMP ARMED.

ACDR And VERB 16 NOUN 4 ENTER.

15 07 39 DMP We've got to get these circuit breakers ...

ACDR Yeah. That - that comes - next thing.

DMP Okay.

ACDR Inform Soyuz, "Prepare for - preparing for undocking."  
(Soyuz, Apollo. Now we are preparing for undocking.)

SCDR Roger.

ACDR Okay.

DMP I'll watch the lights, Tom.

ACDR All right, should be coming on.

DMP ... amber.

15 08 32 ACDR Okay. Next one should be coming bright, there.

DMP Yep.

ACDR Okay. 2 - 4 - 6 - 8 ... 12. Okay ... got ...  
alined ...

ACDR ... Should be alined with the IMU.

DMP Yep.

ACDR Over Quito, we turn ABSORPTION POWER, ON. I guess  
this time after 99:04 I'm going to be ...

15 10 19 ACDR Okay. Acquire ATS, ... down here at 90 - Why do we  
still have that O<sub>2</sub> FLOW HIGH?

CMP You got that off down there, that valve?

ACDR ... checking ... Yeah. That ... going on ...

ACDR Everything off?

DMP Yeah.

ACDR Makes me want to try - -

CMP ... malf.

ACDR What?

15 11 22 CMP It was the - urine thing that broke open.

ACDR Did you put it closed?

CMP Yeah. Closed it.

ACDR Okay. What do we got?

CMP Where's the ...

ACDR Got to be ...

CMP What?

DMP Got to be .... Well, I'm going to ... while you're ... There's dirt on it.

CMP Dark picture. ...

ACDR We got plenty of film on ... Hasselblad, but it's not out, is it?

DMP ...

ACDR Perhaps we should have a new one on here. No.

CMP ... it's got 23 ... the other 15 ...

15 12 19 DMP What is that? Look down there.

DMP ...

ACDR ... Well, it looks - it looks as if the ...

CMP Huh?

DMP ...

ACDR All out?

CMP Maybe we should ...

DMP Yeah, it did. ...

ACDR Okay. Put this back ...

15 12 59 CMP Okay. I wonder if we've been shooting blanks?

DMP I don't know. Okay. ... go ...

ACDR Okay. The film's okay for the - that's the reflex, right? CX12. ... CX12 from A-6. CX07 and CX08 from B-5. We'll clear up ...

CMP Okay. We'll get the CX12. If you want to hand me the old one, I'll put it away.

DMP ...

15 13 35 CMP You've got a slide back of the window somewhere. A cloth.

DMP On the window?

CMP I mean on the ... Yeah. ...

DMP Okay. ... working here ...

ACDR Here you are, Vance.

CMP ... B-5. ... get one more thing in.

ACDR That puts us back, what?

ACDR Same place ...

DMP Yeah.

DMP Okay. That's 47 minutes ...

15 14 53 SCDR Apollo, Soyuz. Are you ready for undocking?

ACDR Yeah, I can get ... other side.

ACDR (...)

ACDR Houston, Apollo through Quito. How do you read? ... ABSORPTION POWER, ON.

CMP ...

ACDR Okay; let's go to that monitor - monitor we have for the ...

CMP Looking good.  
 DMP ... On the test meter position. ...  
 CMP ... Well, let's see what it's doing. Okay; it must be about C, 8. Okay. It must be 8, C. Okay?  
 DMP Make sure. ...  
 CMP I did.  
 DMP Okay.  
 CMP ...  
 ACDR And I got that on time. ...  
 15 16 24 ACDR Houston, Apollo through Quito. How do you read? Houston, Apollo. Houston, Apollo. If you read, we forgot to give you absorption power. We'll acquire ATS - in another 3 minutes when we undock. ...  
 CMP You got ATS set up?  
 ACDR Yep, I got it set up; I'll reverify that.  
 DMP Okay, now Vance, ... as far as I'm concerned ...  
 CMP Okay, but I don't want to rush the part where we're getting into min impulse burn. Seems like - you have to be in a hurry to get your maneuver.  
 DMP Yeah.  
 15 17 19 CMP And I want to do the min impulse right.  
 DMP You're right. We'll do it all right. Yeah. You're right.  
 ACDR Okay; - -  
 DMP Mainly, I guess we'll ...  
 ACDR - - passive undocking checklist.  
 CMP Right.  
 DMP You - you don't have ...

ACDR Vance, what time you got?

DMP ... undocking. At this time, we set the clock.

CMP At when?

ACDR 56. ... All right, I got a bunch of things ready to go through ... burn ...

DMP Yeah. Okay.

ACDR Say, you ought to set this over there.

DMP Yeah. ... I want to go to ...

ACDR Right. Right.

DMP ...

15 18 28 CMP Hey, Deke. You got a spare in your pocket?

DMP Yeah. It's ... I need one for this ...

ACDR Okay. ...

DMP Well, Vance ...

CMP Want your jacket? I'm going to get mine.

ACDR Put it on, you mean? Yeah, I think I will too ...

DMP Only because that one little old thing.

ACDR You want a spare flashlight bulb right now, Vance?

CMP Yeah. I - I've got a good one ...

ACDR You got a good one. Well, you ought to - maybe when you go down there, ... Both of mine are stuck up here on the ...

15 19 10 DMP I got one spare. The others have been ...

ACDR Yeah. But I need one to go down - -

ACDR I had it right here in the ...

CMP How much time we got?



DMP 30 minutes - Well, we got 4, I think 4 ... I ...  
preloaded it ... time. Take it from storage. ...

ACDR ... I had it right here before we docked because I  
wanted to get ... right here.

ACDR Okay. ...

CMP ... show, huh?

ACDR Well, wait. We hit - came up with the ...

15 20 22 ACDR Yeah, we still got - we still got ATS - should be  
coming up at 59. We should have ATS now. We got it.

DMP There you go.

15 20 34 ACDR Roger, Bo. Read you loud and clear.

ACDR Roger. RELAY and we have the UV ABSORPTION POWER, ON,  
at 98 plus 56 plus 00.

ACDR ...

ACDR Not really.

DMP ...

ACDR I don't - I don't want to tell. I could ...

CMP Yeah.

ACDR It's right over me. ... for the docking module.

15 22 53 SCDR Apollo, Soyuz.

ACDR ...

SCDR We are ready to undocking.

DMP Okay. ... DAC on right now. Okay. We never got  
any film in there, did we?

CMP Well - Yeah, I ...

15 23 08 SCDR Undocking, Tom.

15 23 12 ACDR Okay. (Roger.) All right; okay. AUTO RCS, 16, MAIN A and MAIN B. EMS MODE NORMAL. DET, STOP. Turn DAC on.

DMP Okay; and then monitor. ...

15 23 41 ACDR Houston, do you have any recommendations for a new film magazine for the DAC?

SCDR INTERFACE SEAL COMPRESS, OFF.

15 23 59 SCDR INDICATOR, OFF. INTERFACE SEAL COMPRESS, OFF.

ACDR Is that interior or exterior?

CMP Evap deactivation. It's already done.

ACDR Any of them back in there? Let's not get all wrapped up in that ...

CMP Yeah.

15 24 17 DMP Or we'll blow this son of a bitch.

ACDR That's right. If they can give us the mag, why - fine, if not ...

CMP Okay. I got one thing here.

DMP We're liable to - -

CMP Let me see if it will work.

DMP We're liable to separate any time now.

ACDR Okay.

DMP Then, man, we got to go.

ACDR Okay. That's right ...

ACDR Okay. We're ready for it, too.

DMP Yeah. Damn sure.  
 15 24 45 ACDR Okay. You got ... Okay; monitor -  
 CMP Looks different. I still - -  
 ACDR ...  
 ACDR Is CMC ON?  
 CMP Yeah.  
 ACDR Okay. ...  
 CMP ... Okay. You told me to press through.  
 DMP Yeah ...  
 ACDR Okay. It's ...  
 DMP Yeah.  
 ACDR Can you just ... with it?  
 DMP Yeah. ... Boy, I'm glad it didn't get that 1-1/2  
 on that ...  
 CMP Shit.  
 DMP Okay.  
 15 28 01 ACDR Okay. I'll - Okay, I'll ...  
 SCDR Tom, be careful.  
 15 28 07 ACDR Okay. VERB 45 ENTER.  
 CMP Okay..  
 ACDR Okay; VERB 45 ENTER.  
 CMP It's in.  
 ACDR VERB 31 ENTER ...  
 15 28 14 CMP Yeah; got it.  
 ACDR RHC LOCKED, verify ... securely locked ... ... down.

CMP MIN IMPULSE ...

SCDR ... now.

ACDR (About 20 meters.)

CMP Okay.

SCDR 15.

ACDR (I can see the antenna.) Okay; he's coming up. You're okay, Deke. Hold what you've got. Yeah. I can see his antenna coming up. Coming up ... right there. Back off from him. Back off. You may have to go to SPS and back off ... Go up.

CMP Yeah. Yeah ...

CMP You're closing on him.

DMP Okay. ...

ACDR Yeah.

ACDR I'd say you're about 40 feet - maybe 35.

DMP ...

15 29 37 ACDR Okay. We're going down ... still closing.

ACDR ... everything else in here.

ACDR Get that switch?

15 29 55 CMP VHF RANGE SET.

ACDR ... DELTA-V SET, BACKUP.

CMP Okay. So, Deke, keep 18 meters ahead of him - -

DMP Yeah.

CMP - - 8 degrees body and P20 is going to do its thing. EMS DELTA-V SET, BACKUP. You got all that stuff?

ACDR Yeah.

CMP Okay.

ACDR ... back ...

15 30 15 CMP Okay. EMS SET, BACKUP.

ACDR He's going to the right a little bit. I still think - -

DMP ... got the right attitude.

CMP About lined up on ...?

15 30 33 ACDR Well, but he's supposed to ...

CMP You got to remember, now, your - 58's holding local horizontal there for you.

DMP Yeah.

ACDR So you need to back up and go to the right - or I can go for - Okay; you got it. Okay.

15 30 48 DMP Man, this is ...

SCDR Tom, what are your range now? Rate.

15 31 28 ACDR (The rates are ...)

ACDR ... the VHF RANGE ...

CMP ...

ACDR Back it up ... to the right.

DMP I know, but ...

ACDR Oh, shit! ... backed it down, Deke. Look out.

ACDR Backed it ...

ACDR God damn.

CMP HAND CONTROL POWER's OFF, Deke.

DMP Was it off?

15 32 08 CMP Yeah, I got it on.

ACDR We called that one off on the list.

DMP           Huh?  
 ACDR           Yeah, we called that ...  
 CMP           Okay; you want to try ... - -  
 15 32 19   ACDR       Back to tracking now.  
 DMP           Okay.  
 CMP           Okay. We're all right now.  
 ACDR           Okay. Try it again, Vance.  
 ACDR           You got it?  
 CMP           Yep, ...  
 15 33 01   ACDR       Wait a minute, wait a minute, wait a minute. ...  
 CMP           I'll give you a VERB 58, and you can take your  
               maneuver here.  
 ACDR           Okay.  
 CMP           Okay ... maneuver ...  
 ACDR           Yeah.  
 CMP           You'll have to move down there.  
 ACDR           Yeah.  
 15 33 02   ACDR       Okay.  
 CMP           Okay?  
 ACDR           Look at the pitch. I still think - -  
 DMP           ...  
 ACDR           God damn. I don't like the pitch. ... pitched up  
               too high.  
 DMP           That's all right. Just get lined up with ATS.  
 15 33 18   CMP       Let's see; we're going to go to ... What are we - -  
 ACDR           ... back off of him ...

DMP        Okay. I ...

CMP        ... get the hand controller and - -

15 33 32    ACDR        Yeah, I know.

CMP        ...

ACDR        ...

CMP        Yup.

CMP        ... get the hand controller back on.

15 33 54    ACDR        I know ... asking what about rates.

CMP        Yeah - EMP. Got it back on.

ACDR        Okay. He's coming up.

CMP        All right

ACDR        He must have ...

DMP        Okay.

ACDR        Get a COAS check.

CMP        Good.

DMP        We'll try again.

CMP        Okay; I'll hit it.

15 34 12    ACDR        Something wrong with those angles.

SCDR        Tom, please inform us about Apollo stationkeeping.

ACDR        (20 meters.)

DMP        It's useless going on, guys.

15 34 25    DMP        ... we're lined up along his axis ... Shit, that's the problem.

CMI'        What?

DMP        We're way below him even though we're supposed to be lined up on his axis.

15 34 39 CMP I don't think we're necessarily ... his axis ...  
 15 34 39 ACDR Yup.  
 CMP And everything's perfect but ... I can recheck  
 P20 if you wish.  
 ACDR Check that.  
 CMP Checked it, and we've got it set NOUN 78. Let's see.  
 CMP ... Okay; plus 90 degrees, minus 82.75, and plus 180.  
 15 35 04 CMP Okay. We're all right, Deke.  
 ACDR That's all right.  
 CMP Got to be.  
 DMP Remember the last time around - -  
 CMP Yeah.  
 DMP - - ...  
 CMP But, if that's the case, we shouldn't worry about  
 it ...  
 DMP ... down here to the ...  
 15 35 18 CMP Yeah.  
 DMP Better go up ...  
 ACDR Got 4 minutes?  
 15 35 24 DMP 99:21. Yeah. ... Okay.

# TIME SKIP

16 14 04 DMP Really ... won't we?  
 CMP We're not falling behind yet in what we're doing ...  
 falling behind on his own.



ACDR Yeah. His orbital ... X-axis ... within his ...  
Try to get him on the spotting scope.

CMP He wanted the - he wanted the lights on so he could  
see if we could see him?

ACDR Yes. I'd like to ... There it is.

CMP Oh, okay.

ACDR See the green?

CMP I'll bet ...

16 14 44 ACDR Deke, ...

CMP Deke?

DMP Yeah?

ACDR Now he's coming around behind us.

DMP That's where we're supposed to.

ACDR You have the one ...

CMP No, that's him rotating, too.

CMP We're not all that - -

ACDR ... yeah, I got him.

DMP ... are those beacons ... 50 meters.

CMP Yes. We're starting to go behind him now. Okay.

16 15 25 DMP Right now, I got about a 3-1/2. Let's see, we're  
within 100 meters, right now. ...

CMP ... must be 10.

DMP Yes. That's been the bias in that all the time.  
Depending on ...

CMP I guess - -

DMP I'll keep it in the bottom - right ...

CMP Great!

DMP ... I just want him to skim through it.

CMP Yes.

DMP We're coming in at what angle?

16 16 15 CMP We're at - 295 right now. No - 45 degrees. Not very far back. I'll tell you, Deke - if we don't start falling behind pretty soon, we're going to have to take a pulse ...

DMP Maybe we ought to do it right now. What's the ...?

CMP Okay.

16 16 34 DMP To AUTO? CMC, AUTO?

CMP Ah - yes. It's CMC, AUTO - and - -

DMP Pulse left.

CMP Pulse right. ...

DMP Left - left.

CMP I mean - -

DMP ...

CMP - - left.

DMP ...

16 16 49 CMP Back to SCS?

DMP Yeah. Then I - -

CMP Then we keep tracking him on - -

DMP I'm tracking.

CMP ... Okay, it's going down. Little better. Boy, your up/down is beautiful.

DMP I'm pretty sure ... 3-1/2, so we shouldn't be - We getting some rate on that thing now?

CMP Yes. I - it just started climbing, though. I think you need another one - another pulse ... But I don't know. You can't get too much closer without having the spotlight on them.

ACDR Yeah. I'm in the process of ...

DMP Tom - Put it down to 1?

CMP Yeah.

ACDR He wants the spotlight?

DMP Well, I don't - That - that doesn't bother me. That's going to be - ... off the bottom ... 150 meters.

ACDR Let's put it on for 2, anyway. All right?

DMP Well, I'll tell you what, Vance. I'll just put in ...

16 17 55 ACDR (Soyuz, Apollo.)

CMP Want more? Okay.

SCDR Roger.

ACDR There's your spot. Look at that. Great.

DMP Right in the field.

SCDR I think - -

16 27 35 DMP Hey, we come in there ...

SCDR Roger, Tom.

CMP MAN ATT, three, MIN IMPULSE.

16 27 39 DMP All right.

CMP Okay. Your - -

SCDR I see your spacecraft very well.

ACDR (Yes.)

SCDR I see you. I see you - and your friend.

ACDR (Fine.)

SCDR Where Dekey-Wekey now?

ACDR (Laughter)

DMP What's that?

ACDR Said where is Dekey-Wekey?

16 28 06 CMP (It will soon be over ...)

SCDR You're right, Vance. You're right - right.

16 28 18 CMP (I think you could hear it.)

SCDR We are going to talk about it after our flight. Tom,  
I have seen your flash.

ACDR (Yes.)

DMP What?

ACDR Maybe he's got a flashlight in there?

SCDR Can you smoke cigarette?

ACDR (No, cigar.)

DMP (Yes.)

ACDR Okay; let's get a picture of that.

16 28 46 SCDR Oh, very good picture, very good picture! Your  
spacecraft made of gold.

CMP You ready?

ACDR Yeah. Get the right exposure.

DMP ... we got 16 millimeter. Anybody got - Wait a minute.

ACDR We got to get a CX - CX 04.

CMP Okay. Got it? God! Look at that!

DMP Got the movie camera?

ACDR No.

CMP Don't even know where it went to.

16 29 12 DMP I got the movie camera, but I ain't got no film.

ACDR CX04 is where it's called. It was just out here about 30 minutes ago.

DMP Let's go and we if we can find one.

16 29 18 ACDR That's what I say. Screw all the other experiments. This is the number 1 priority for flying the mission. Fuck. Take all the film you want.

16 29 42 ACDR I am.

DMP Boy, we're going to have a problem here now, though. That Sun's going to be right in my fucking eyeballs. Well, I think I'll maneuver out of the way. Boy!

DMP Okay. How much time have we got until we do the - 500?

ACDR Okay; just let me look at the Plan.

CMP Well, I'll tell you. Here's a CX05, if it isn't shot up.

DMP It won't do us any good right now, because - -

ACDR Yeah, color exterior.

DMP Yeah, except that Sun is bright. ...

ACDR Go ahead and load the thing up.

CMP I may have to scream for help from someone.

ACDR Okay.

16 30 33 CMP Here's the PAO - -

DMP That's good. Hand it over.

CMP - - ... Yeah.

ACDR I - I - -

DMP ... If you want - -

ACDR - - I can handhold it over here if you can ... over here, Deke.

DMP Yeah, but ... into the Sun, Tom.

CMP Okay. I'll do it.

ACDR I can see him okay.

DMP Oh, I see.

ACDR I can see him in good shape.

16 30 46 DMP Yeah, okay. Well, I'm not worried about the pictures at this stage. I'm worried about losing him visually ...

ACDR Yeah, I see. The Sun's coming out right behind him.

DMP Yeah, I know. ... I can barely see him.

ACDR I - I've got him. I can get him with the movie camera.

CMP Oh, you can? Okay, then, let me give you the movie camera.

ACDR We better call him ...

16 31 07 SCDR Roger, Vance. It's a very good show.

ACDR Let's just string it out. That's okay.

DMP ... up there. That's right.

ACDR Got the power on?

DMP Well, he pulled the plug. Vance pulled the plug on it. Here it is.

ACDR Oh - okay. I can - -

CMP No plug on that thing.

ACDR That's okay. I'll just put it ... you put it across at the beginning ...

DMP You don't see the Sun, Tom, huh?

ACDR No, I ... see him out in front of me.

DMP I'll be damned.

CMP (Please.)

SCDR Tom, I see you have not ...

ACDR (Yes.) ... part of me. I can't get ...

CMP (Please, hold your cue card.)

DMP Seems pretty upset that you were going to be ...

DMP That's why they wasn't predicting.

16 31 50 ACDR Yeah. It'll go by in a minute at orb rate.

CMP Yeah. I don't think you'll lose ...

CMP I think the rates are pretty - -

ACDR Our rates are in good shape here. I can still see him out of a quarter of my ... You're okay. You've got perfect spacing. Don't sweat it. Vance ...

CMP (... like a grown up.)

16 32 13 ACDR Okay; let's make sure we've cleaned up these ...

CMP Yeah.

ACDR It's okay, Deke. I can look way down in the corner ...

DMP Yeah. I don't see him. I'm working my way down here.

CMP Can you maneuver to local horizontal? You're supposed to aline the IMU when you get a chance, and we'll set the DET up to the 500 meter.

DMP Depends on where and how ... Okay, what's - -

16 32 34 CMP Tom? I'll bet you a nickel Alexey wants you to turn on those lights until the programed time.

ACDR Yeah. ... Damn.

DMP That would have been the most frustrating thing in the world to ... that old son of a bitch the one time you need it.

ACDR Okay. We got him finished. Okay.

CMP One thing that worries me is that window. That could bomb out the whole thing, too.

ACDR Sure could. I got 17 minutes to ...

ACDR What's the high-gain angles.

16 33 24 CMP I find you can see him if you kind of stay along the window.

DMP Yeah. I wonder if this - -

ACDR Well, what are you ...

DMP Man, we could see him outside, I think, 100 meters, Tom, with that spotlight.

ACDR Oh, yeah. That's what people said you couldn't - Jimmy said - Jim Sutherland said - over 300 feet with it. He got the same spotlight.

DMP ...

ACDR ...

CMP Well, I'm glad it's not biased the other way.

ACDR Yeah.

CMP We could have flown ... this week ... relied on it.

DMP Well, soon as we started out, kind of allowed the God damn relative position ...

16 34 21 CMP Yeah. I wonder if he's got his beacon off now. No?

DMP The damn light's not where I can see it..

CMP Maybe ... you ought to remind him. ...

DMP We supposed to call him on it?

CMP Yeah. (Soyuz, Apollo.)



ACDR Hand that to ...

DMP Want to have this, Tom?

ACDR No - no - okay.

CMP (Soyuz, Apollo.)

16 34 43 SCDR Go ahead.

CMP (Alexey, release ... communication ... double VHF  
SIMPLEX.)

ACDR Hell, I can't see him because of the Sun angle.

DMP Well, I can see him enough to go - -

ACDR All right.

DMP ...

ACDR What we've got into the roll ... getting fucked. ...  
roll ...

CMP Okay. Our EXTERIOR LIGHTS RENDEZVOUS, OFF?

ACDR I think we've fucked.

CMP ... spotlight. And configure for VHF SIMPLEX, which  
I think was A, SIMPLEX. ...

16 35 48 CMP Okay; you can roll to a heads-down attitude when  
you're ready, Deke.

DMP ...

ACDR Well, okay. You got to have a new - yeah, you have to  
have a new VERB 25 NOUN 78 on that ...

CMP Nope - not - well, when we start the roll maneuver.  
But - I guess we could ... until Deke is ready  
here. ...

ACDR ... 90, 972 ...

CMP Right.

ACDR In other words, ... the roll. ...

CMP Deke, can I set your DET counting up to 100:50.

DMP Yeah.

16 36 33 CMP Then, as soon as Deke says go, why - then we could ... that, I think.

DMP You better get that foot a little higher; you'll hit the roll.

ACDR Yeah. ... hand. ... docking mechanism. Okay. ...

DMP Say that wasn't ...

CMP Pretty bright, isn't it?

SCDR Tom, at this time, I'm going to restation our spacecraft from 104 to 020.

ACDR What ... back to zero ...

SCDR You understand me?

ACDR (Roger.)

DMP ... I wonder if we could get him to wait - -

ACDR He's only 17 minutes late. He's only 17 minutes late here.

SCDR Tom, how do you read me?

16 37 54 ACDR (Roger, ...) I got him. ... tying him down ...

SCDR Oh. Just now, I am going to - do the following maneuver. From ... to zero.

ACDR (Roger. Roger. Go on, please.)

DMP ... Say, and I'll tell you - ... I've got this ... camera here ... spotlight ...

16 39 03 DMP ... the Sun out of the window. ...

ACDR Okay; go ahead Vance. ... NOUN 78 before we roll? It is, isn't it?

CMP Yeah, uh-huh. But if - Right, it's usually before.  
If you set it now ... you'll get a NOUN 58.

ACDR Yeah.

CMP And it will say - take us to another attitude.

ACDR Yeah.

CMP ...

CMP Well, that was exciting.

ACDR Yeah.

16 39 43 CMP God damn. I figure we got data from what - about 3  
degrees here. Something like that?

ACDR ...

DMP ... ... lucked out ... Because theoretically, that  
thing should have been ...

CMP The thing is that the burn charts were working pretty  
good. What to do to those oxygen ...

ACDR Yeah.

CMP ...

ACDR ... Deke.

ACDR Oh, I see him now. He's up there.

DMP Dropped down below again ...

CMP (Laughter) God damn. That could burn your eyes out  
too, couldn't they. Yeah, I see him; he's coming out.

DMP ... pretty good ...

16 41 14 SCDR Tom, Soyuz orbital orientation established.

ACDR (Roger.) I'll be fucked if he claimed it wasn't.

ACDR ...

CMP Yeah. Not with respect to us they're not.

ACDR Yeah. But ... the horizon.

CMP Yeah. Not with respect to - We're level with the horizon.

DMP I'm going to get up ... roll.

CMP Maybe he's still - -

DMP ... MAN ATTITUDE.

ACDR May be yawing 180.

DMP We're looking down his God damn neck.

ACDR Yeah. His axis - X-axis - that's ... I thought he was yawing.

CMP My COAS is on him.

16 42 31 ACDR Wait a minute; I see what he was doing. But it must be taking him forever. See that? Yawing now.

CMP Aw, hell. He's getting fucked doing it. That's a weird looking spacecraft.

DMP Really weird. ... Yeah, we're going to get good ...

DMP Okay; now before we start the 500, ... 180 roll, right?

16 43 20 CMP Yep. Don't know ... to get all the data there.

ACDR Okay. Got a ready.

DMP ... behind him. Let's see a 180 - We're going to be - he's going to ... Right? ... should be reading right now.

CMP ... schematic ... looking at it sideways. And I believe that's what you do.

ACDR ... we're a - we're out of plane ...

DMP ... reflector's on the right side of it.

DMP He ought to get yawed - he ought to be doing his yaw 90 degrees to the left ... the reflector.

CMP What's that?  
 16 44 23 DMP Why would he - be there. He's going to ... around  
 and move out of plane, and instead we'll end up yawed  
 90 degrees, ... reflector to look at.  
 ACDR Are we in plane now?  
 DMP Not quite, but almost. We're in plane, we're just  
 not ... yet. We ... even gone to zero degrees yet.  
 DMP Well, let me get up over here for a minute.  
 CMP And any time you want to roll, why - -  
 DMP ... ... I want to get that lined up ...  
 CMP Tom, why don't you give me that - ... the numbers in  
 the computer, but I ...  
 CMP Okay. NOUN 78.  
 ACDR VERB 25.  
 CMP Okay.  
 16 45 33 ACDR Plus 90 degrees, plus 9725, plus 18000.  
 DMP ...  
 DMP Oh, shit! ... Get setup for the roll?  
 CMP Yeah, we're setup now.  
 DMP Okay. The problem is the computer ... roll ...  
 CMP Computer will roll. Computer is rolling.  
 DMP Yeah. Got a low rate, though, with that.  
 ACDR Yeah.  
 DMP Let me get up here and really ...  
 CMP Okay. Come to think of it, though, entered ...  
 ACDR You did?

CMP Yeah. ...

CMP Okay. I guess I'd better go back and reload the originals, again.

ACDR ...

16 47 16 CMP ... seems to think so. It starts in about a minute or so.

ACDR Probably ...

CMP We're getting this uplink activity light - light ...

DMP We are? Here it is ...

CMP Okay.

ACDR The first one is okay. The second one is minus 8275. VERB ...

CMP Okay; give me the whole thing, and we'll back up.

ACDR Okay; plus 90 degrees.

16 47 48 CMP Plus 82.75?

ACDR Minus 8275. Plus 9 and minus 8275.

CMP Plus 0?

ACDR Plus 180. 180 degrees. Okay.

16 48 20 CMP Plus 180.

ACDR You want this camera back over there?

DMP ... pictures. ... before they do the ...

CMP Okay. ...

ACDR Okay. Plus 90 degrees.

CMP Okay.

ACDR Minus 8275. Plus 180; 180 degrees.

DMP        Okay. We ... .. you guys are ready, I'm going to  
begin the roll.

16 49 22    ACDR        Okay. ...

            CMP        Okay.

            ACDR        Ready?

            CMP        I'm ready.

            ACDR        Ready, Vance?

            CMP        Yup.

16 49 28    ACDR        Okay. Let me ... Okay. Vance, enter those new  
numbers?

            CMP        Yup.

16 49 32    ACDR        Okay. MANUAL ATTITUDE ROLL, ACCEL COMMAND. MANUAL  
ATTITUDE - RHC, roll 180 degrees at 2 degrees per  
second.

            DMP        Okay.

            ACDR        ...

            DMP        Okay.

            ACDR        Ready to go?

            CMP/DMP    Yeah.

16 49 54    DMP        What happened here? ... There we go.

            CMP        Yeah. That frightened Tom. (Laughter)

            ACDR        (...)

            DMP        ... COMMAND. Won't stop rolling.

            ACDR        Did it stop?

            DMP        ... God damn.

16 50 17    CMP        You're in MIN IMPULSE. Oh, I see. Okay.

DMP Wait a minute ... rolling.

CMP Yeah. ...

DMP Oh, okay.

MS ... after awhile.

DMP Go ahead, Tom.

DMP Whoops, there's the God damn ...

ACDR They are, Deke, making it tougher than hell.

DMP I think they're doing something, and I discovered they hadn't.

ACDR ...

CMP Okay, Tom?

ACDR Yeah.

CMP Give me the new numbers now.

ACDR Okay; the new numbers: plus 90 degrees, plus 97.25, plus 180. Oh beautiful! Right there, Deke, you're there. Continue horizontal.

DMP ...

ACDR Roger. We've just rolled 180 degrees, Bo.

16 51 31 ACDR Okay. Back to CMC AUTO.

CMP Deke.

DMP What?

CMP Got a picture.

DMP Go ahead.

CMP Okay.

ACDR (Soyuz, Apollo.)

SCDR Go ahead.



ACDR Okay. Power on, and it's bleeping back and forth ...  
0.3 ...

USSR (Moscow, I read you.)

DMP I'm going to close up on him just a little. Our ...  
too far out.

ACDR Okay. You hear what he said he's going to do? He  
wants ... rear reflectors.

USSR (Regards to the personnel and thanks for your good  
work. We'll receive your congratulations after the  
flight. Great thanks.)

DMP I didn't hear what he said.

ACDR I couldn't remember what you - what Bo said.

ACDR (Yes. MCC Moscow wants to talk to you over our ship.  
Over.)

SCDR Okay, we are ready.

ACDR They're ready; they got it.

DMP We all set here now?

CMP Yeah. You're all - -

SCDR (Moscow, Moscow this is Soyuz. How do you read?)

16 52 29 ACDR ATTITUDE SET to GDC.

MCC-M (Thank you. Read you loud and clear.)

ACDR Where is that?

CMP It's on the checklist. It's not important.

USSR (We are located now ... At the right, we see the  
Apollo spacecraft.)

16 52 51 ACDR CM function ...

USSR (Everything is nominal.)

CMP Okay, how we - -

USSR (Thanks.)

ACDR They want to use their rear reflectors.

DMP ...

16 54 03 CMP You know what? I don't want to get them in trouble or anything, but I'm wondering if they have a light leak in the window ...

DMP You can damn well see some light in the window.

ACDR ... Yeah. That's right.

ACDR Okay.

CMP That just might be what ...

ACDR Oh, okay.

CMP Houston, Apollo.

16 54 44 CMP Loud and clear, Bo. Bo, we have a question.

CC-H Go ahead.

16 54 51 CMP We thought we could see a light leak in their window - or perhaps not covered - one or the other. Would that have any effect?

CC-H We'll check.

CMP Look at the contrails down there.

ACDR Yeah.

16 55 13 MCC-M (Soyuz, this is Moscow. How do you read me?)

ACDR Can't you see the way the damn clouds are moving?

CMP Oh, I see. Those, you mean. I thought you meant - -

ACDR Yeah.

CMP - - some kind of ...

ACDR Oh, no, no. See the way the clouds are moving?

CMP Oh, yeah.

17 06 30 DMP ... you guys, we're coming up here on 4 minutes.  
 CMP Okay.  
 DMP 101:28.  
 ACDR Roger. Is that the data take?  
 CMP That means that we can be late ... 30 minutes.  
 DMP/ACDR No.  
 ACDR 101:08. That means we got to be there - a data take in 24[?] minutes.  
 DMP Okay; we're counting down and we got ... minutes to go.  
 CMP I thought you said start the burn.  
 SCDR (...)  
 ACDR Understand, Bo.

17 07 36 CMP Okay. Tom, are there any last-minute things before 59:30?  
 ACDR Don't think so. Okay; let's - Oh, ... RCS - SCS RATE COMMAND; RHC, ARMED.

17 07 48 CMP Yeah. That's ..., but nothing from - up to that point, huh?  
 ACDR Nothing here. We got the get evaporator deactivated and get plus Y to the right ...  
 CMP Looks like we got good initial conditions here.  
 DMP ... window there?  
 DMP (I see you, Alexey.)  
 SCDR We see you.  
 ACDR Houston, Apollo.  
 SCDR I see Vance now.

DMP (...)

SCDR Very good. 50 meters.

DMP (Well.)

17 08 44 ACDR Okay. On this start here, right now we're going in-plane forward; and he's yawed 90 degrees. Affirmative?

DMP I don't know what he's going to do.

ACDR Is he going to keep his present - -

CC-H ...

ACDR Okay. Yawed 90 degrees to the velocity vector. All right.

CC-H ...

ACDR (All right) ...

CMP Okay; they're doing ... Right.

DMP ... right. Okay.

CMP And 59:12.

ACDR ...

DMP Yeah. That'll do ...

CMP Okay.

ACDR ...

CMP Go to SCS; three RATE COMMAND, MAN ATT; and RHC, ARMED. Hey, you did 11 degrees both ways, Deke.

17 09 45 SCDR (Moscow, this is Soyuz. I read you excellently. How do you read me?)

CMP You wanted auto maneuvering.

DMP I think the maneuvering, Vance, unfortunately, is going to be - -

ACDR ... I think you're still about 25 feet from ...

DMP I'll back ...

SCDR (Moscow, Moscow.)

17 10 02 ACDR Check the maneuver, Vance, I'm going to drop.

CMP Okay; no sweat.

17 13 45 ACDR Okay, we're back banking now. All right.

CMP They may have to come down about 12 degrees.

ACDR ...

CMP Four degrees, yeah.

SCDR (Moscow, this is Soyuz. I hear you excellently. How do you read me?)

ACDR Let me get the yaw around; the yaw is in now. Okay?

CMP Yaw is right in.

ACDR Uh huh.

CMP ... Where you want to be?

DMP ...

SCDR (Moscow, this is Soyuz. I read you excellently.)

CC-M (Roger, Soyuz.)

17 14 23 SCDR (Now the situation is as follows. Apollo went by our rear, and we saw it through our right window. The distance was about 30 or 40 meters. It is holding distance very well. Now I'm watching it through the right window. And we'll maneuver should something happen. Over.)

17 14 45 DMP Okay; how's the - -

CMP Okay. Your roll is ...

SCDR (It is a 180-degree roll, in relation to us, upside down.)

DMP Okay; yaw is ...

DMP Okay. How is the pitch coming there now?

CMP You're about 11 degrees - -

DMP Okay; I'll ... the auto maneuver.

17 04 16 ACDR They're still yawed 90 degrees, Bo.

DMP It said 90 degrees in the orbital plane, here.

ACDR They're not yawed in plane, Bo; they're 90 degrees to it.

CC-H Roger. Understand. ...

CMP Okay. Thanks, Bo. Thanks, Bo. For your info, we grabbed that one because we couldn't find the first one you called up. It was a PAO mag.

17 04 46 DMP And, for your info, Bo, the last time we came back into plane, we were still in the dark, and ... Sun rising right behind the Soyuz was a real bear. Can anybody tell yet if that's going to happen next time around?

DMP Okay. I just wanted to inform you that the last time around, we came into plane in darkness, yet. And turns out that the sunrise is directly behind Soyuz. And we had a difficult time there until the Sun got over our head. I would expect the same thing to happen at the 500 meters.

CC-H ... and I understand ...

DMP Hey, wait a minute. We're behind - we're ahead of him now. We are be - -

17 06 01 ACDR Yeah, ... We are behind him going forward - we are behind him going forward. We are plus-X forward in the plane.

DMP Will be when we get around there.

CMP Yeah, the second one is just coming back in an opposite direction, sort of.

ACDR Yeah, ... yaw zero.

CMP ...

DMP ...

ACDR ... damn right.

CMP Where?

CMP Okay, you'll ...

DMP Just wait a minute and I'll - -

CMP Okay. You're real close now - 4 degrees ...

17 15 35 SCDR (...)

CMP Okay; you'll see them - -

DMP ... see them.

CC-H Apollo, Houston. We'll be - we'll be coming up on sunset here in just a few minutes.

ACDR Okay.

CMP Okay; it's coming in by itself.

DMP ... Coming in.

CMP Now it's a matter of going in. Be a little harder in the dark.

DMP ... CMC?

CMP Yeah. First you better go ahead and go back to the configuration for NULL ... as before.

17 16 03 DMP Yeah. Okay. Now where should I be in the ...?

# TIME SKIP

17 49 16 ACDR You want the spotlight on him, Deke?

DMP ...

CMP Yeah. How far out ... 44?

DMP 45.

CMP Houston, Apollo.

CMP Apollo, Houston. We got out to .24 on the EMS, which is obviously biased.

DMP ...

17 49 49 CMP - - on the 500. Roger.

DMP Okay.

CMP Think we should ...

DMP ...

CMP Good. Okay.

17 50 13 DMP Oh. ... see he's out there, ... turn those off.

17 50 19 ACDR Okay.

CMP ... I think we - we got two good data takes ...

DMP Yeah, it's very likely ...

ACDR Where are you - where are you at down here?

CMP Okay. We're at ..., Tom.

ACDR I don't have that.

17 50 44 CMP Look down past the 28-minute burn. We've done the MIN IMPULSE, the CMC, RHC, LOCKED - -

ACDR CMC.

CMP We've got a VERB 16 NOUN 04 - -

ACDR Yeah.

CMP ..., COAS, and after ... we get in close enough to stop, why, that's when it's - we'll be - Later, we'll be in SCS.



DMP ... going to need that ...

CMP Yeah, I think. Let's not be doing the work that's - -

DMP Might as well do that 50. ... we'll be in primary ...

ACDR Okay. Primary glycol - -

CMP ...

17 51 25 ACDR Primary glycol activation.

CMP ... okay. You got that? You're going to the sextant?

ACDR What time is it? Yeah, we've got - we got finished up pretty quick.

CMP Pretty close, yeah. Just about on time.

ACDR Yeah. Yeah, we're right on time.

CMP ... your clock.

DMP Yeah.

CMP ... good. And ... quad ... Right about ...

DMP Oh. Oh.

ACDR Where'd you find the CM ...

CMP I found it up in ... I don't know what it was doing there.

17 52 22 ACDR It's supposed to be in the docking ...

17 52 48 DMP I think I got some ... film ...

CMP Very good.

CMP It's beautiful when daylight comes up.

DMP Oh, yeah. It's beautiful ... came over the horizon down there. You can see the backlighting on it - the silhouette. ... things ... my camera ready. Go to the ... attitude in 5 ...

CMP Yeah.

ACDR Aha. That ... is CX04, PAO. Ha - ha. Right.

CMP You know, I still can't get used to the fact that the sky and the ground seem to flip-flop.

ACDR Oh, yeah.

DMP Yeah.

ACDR You peek out there and you think that blue stuff is the - -

CMP ...

ACDR - - ground.

DMP Yeah. Sure does it.

17 54 08 CMP Boy, his spacecraft sure looks good.

DMP Green ...

CMP Huh?

DMP Looks like green ...

ACDR Earth obs and solar eclipse.

DMP Think we already did the solar eclipse. ... Far as I know, there's only one magazine ... Earth obs. Gee, I hope - ...?

ACDR Yeah.

17 55 42 CMP Ready? (Ready? ...)

ACDR We took ...

CMP ...

ACDR We've got to get a good picture here of this thing.

CMP Yeah.

DMP ... Let's see ... It's really far out. We can go with a spot, change the light. I probably won't though. Let's see, Sun will be - -

CMP The Sun's coming up.  
 DMP ...  
 CMP ...  
 DMP How're you going to ...?  
 ACDR ..., Deke?  
 CMP I can do it right here.  
 SFE Apollo, Soyuz. What is the range now?  
 17 57 12 DMP (Ah, Valeriy. Right now, 5 feet.)  
 SFE 3 feet?  
 CMP Oh, Deke?  
 DMP (5 feet.)  
 SFE (Okay.)  
 17 57 36 CMP Here it comes. Get it. Man!  
 DMP ... (Laughter) ... Still don't think those ...  
 engineers ...  
 CMP Maybe not.  
 DMP ... we've got it spotlighted.  
 CMP Yeah.  
 17 57 58 DMP Okay.  
 ACDR ...  
 DMP ...  
 CMP Well, it's about 0.3 or 0.4 - It really doesn't ...  
 DMP See, got ...  
 CMP Yeah; 0.04, Tom.  
 DMP ... And the next ...

CMP But that's quite a way ...  
 DMP Yeah. Should be - we're supposed to be through ...  
 17 59 24 ACDR (We didn't have dinner ...)  
 CMP (...)  
 DMP ... lights. Turned them off.  
 CMP Yeah.  
 18 01 30 CMP (... dinner)  
 SFE Roger; ...  
 CMP Yeah.  
 18 01 59 ACDR Okay. You break out 90 degrees from the orbital  
 flight plane.  
 CMP What? Ah, well ... roll ... is not ... It can go out  
 of band. We're coming in one ... of his ... because - -  
 ACDR We're coming in ...  
 CMP Yeah.  
 ACDR Okay. ...  
 CMP Yeah.  
 ACDR ...  
 DMP Okay; I'm going to get this ...  
 CMP Okay. SCS and RATE COMMAND.  
 18 03 02 DMP Okay. RATE COMMAND ...  
 CMP And I'll start monitor - -  
 DMP ... COMMAND. Okay.  
 CMP Go on MANUAL ass - ATTITUDE, MIN IMPULSE, all three.  
 (Laughter)  
 18 03 21 DMP MIN IMPULSE.

CMP Track Soyuz. And ... NOUN 78.  
 DMP Okay. It's a little high in the ...  
 SCDR Tom, when are you going to finish your work?  
 ACDR (Soon.) ... finish your work?  
 CMP Hey, look at all the clouds that's down there, all ... circle.  
 18 03 59 DMP They didn't tell whether to push her down or not, Tom. Hold on. Okay. RATE COMMAND?  
 CMP Okay. Yeah.  
 DMP ... MAN ATT and pitch, RATE COMMAND, huh? Right?  
 CMP Yeah. RATE COMMAND, three of them.  
 18 04 17 DMP Okay. ...  
 CMP And - -  
 DMP - - want to pitch down.  
 CMP Okay.  
 DMP Four jets?  
 CMP I think - -  
 DMP Okay. What do you think? Supposed to be - -  
 CMP Okay. The up one.  
 CMP Yeah. The only thing is I don't know when you pitch down ...  
 DMP Yeah.  
 18 04 42 CMP Okay. ... up. Yeah. Okay. The other one's okay.  
 DMP ...  
 CMP Okay. Meters are doing fine. Your up down's pretty good.

DMP ... I've got to get it back in here ...

ACDR ..., Deke?

DMP Yeah.

SCDR Tom, what is the range now?

ACDR (Right now ...)

CMP ...

SCDR Apollo, Soyuz. What is the range now?

DMP Tell him ...

ACDR Yeah.

ACDR (Soyuz, Apollo. Right now, 55 meters.)

DMP ...

CMP Yeah.

ACDR Yeah, yeah. I think that range is normal.

SCDR Apollo, Soyuz. How do you read?

ACDR (Okay. Excellently. How me?)

CMP Okay. You're up to 5 degrees. ...

DMP Plus 5?

CMP No, you've got to go minus ...

18 06 27 ACDR (55 meters.)

ACDR What step are you at?

DMP Oh, about ...

18 06 47 ACDR (... meters.)

DMP ...

ACDR What ... have you got? ...?

DMP ...

CMP Okay. That's 15.

ACDR ... looks like 30. Been waiting ... 20 meters.

CMP Yeah.

ACDR Right.

CMP (Laughter)

ACDR (Look at your orientation lights.)

CMP Yeah. Going back to 3 degrees? Yeah.

SFE Orientation lights off; beacon off.

18 07 50 DMP Probably be 20 minutes before you can - -

CMP Okay.

ACDR We're supposed to do it right here.

SCDR How do you read me, Tom?

ACDR (I read you well. How do you read me?)

SCDR I read you well. Okay; what is the range now?

CMP 5 degrees off of roll - -

ACDR (50 meters.)

CMP ...

18 08 11 DMP ... over there, we'll go minus X for 3 seconds.

SCDR Did you finish your work?

ACDR (Yes, I had my breakfast.)

DMP Okay. Let's go to minus X.

SCDR ...

DMP ...

CMP Yeah.  
 DMP Plus for 3 seconds?  
 CMP Right. ...  
 DMP Yep.  
 SCDR Tom, did you collect data?  
 ACDR Yeah. (Goo - good data.)  
 DMP Okay. Now - -  
 SCDR Okay.  
 CMP Okay. You ready? Let's get going. MIN IMPULSE,  
 CMC, RHC LOCKED, then - well, I'd let the computer  
 take it. ... this VERB ...  
 CMP Turn to - -  
 DMP I think it's down.  
 CMP It's up.  
 DMP No. I think it's down.  
 CMP Well - -  
 DMP Okay.  
 CMP - - since we're almost - Well, - -  
 18 09 38 DMP We're about there. Let's take it. Okay; this is -  
 MIN IMPULSE ...  
 CMP CMC, MIN IMPULSE.  
 DMP CMC. Yeah. ...  
 ACDR Have you got CMC ...? Got - -  
 CMP Get it?  
 ACDR Yep.



CMP And lock RHC?  
 ACDR Yeah.  
 18 10 11 CMP We're locked up.  
 DMP ...  
 CMP Yeah.  
 ACDR I think ... I don't think we've got it all.  
 DMP Okay.  
 ACDR I don't see his ...  
 CMP Okay. Your needle's are set ... Okay; I don't -  
 ... never went down to low. We're down to - -  
 ACDR You want me to take that?  
 CMP - - 112. Yep.  
 ACDR Okay. ...  
 18 10 48 CMP Yeah. Okay. What's next?  
 DMP Don't know.  
 CMP Okay. ... back.  
 DMP ...  
 CMP Okay. We're going to do this at 50 meters for a  
 heck of a long time, so when you get a chance to,  
 GDC aline to 0,0,0. And we'll set the DET up. We've  
 got quite a way ... Okay; there's 102:16:00.  
 ACDR You subtract that ..., huh?  
 CMP Yeah.  
 ACDR Maintain 50 meters.  
 DMP When are going to do ...?  
 ACDR Aw, not too much longer.

DMP Then we'll be back ...

CMP We don't have as much time to wait as you might expect to - Let's see, 102:16 plus - -

ACDR ...

DMP ...

ACDR Okay.

DMP Okay. If you want to, you can align that ...

ACDR You want to set it up - check the checklist? Check on page 7-16. You want the checklist? He wants the checklist.

CMP Yeah. I'll have to check. I'm right in the middle of the checklist.

18 12 40 CMP Okay. You listening, Tom?

ACDR Yeah.

CMP GET is 102:16. And that's plus - -

ACDR Plus - 7.

CMP 7.

ACDR It's 23 or 22 to ...

CMP 37 ... Yeah.

ACDR Start it in 7 seconds.

CMP I - Oh, yeah. I'm sorry. ...

ACDR Oh.

CMP ...

18 13 05 ACDR Okay. (Soyuz, Apollo. Right now, turn on second VHF SIMPLEX. Soyuz, Apollo.) Soyuz, Apollo.

SCDR Go ahead, Tom.

18 13 49   ACDR     (Excuse me. Delta 2 VHF SIMPLEX. Over.)

SCDR       We received you.

ACDR       (Okay.)

CMP        Hey, your ... got in too close, ... (Laughter)

ACDR       Okay. We've got ...

CMP        ...

DMP        Yeah.

CMP        Okay.

DMP        ...

CMP        ...

DMP        ...

DMP        ...

ACDR       Yeah, I - How much was that last one?

CMP        What rev's ...

ACDR       ...

CMP        ...

DMP        ...

18 18 50   ACDR     ... No, ... I don't want - -

ACDR       ... What page? ...

CMP        ...

SCDR       Did you already finish your work?

ACDR       (Yes. I finished everything.)

18 19 46   SCDR     In 5 minutes, we are going to photograph Apollo.

ACDR       (Roger.)

ACDR Coming up on that maneuver now?

SCDR (You know?)

CMP ...

18 19 56 ACDR Okay. Here we go.

ACDR Okay; verify. Okay. When we get up to there, which is 102, 3, 4, 5, 6, 7, 8 - at about 8 - -

DMP ... here?

ACDR Translate down ...

DMP 102 ... 3, 4, 5, 6. Okay.

18 20 21 ACDR That's where you've got it? I've got MANUAL ATTITUDE, RATE - I've got FDAI scale 5 and 5, SCS - -

SFE Are you ready for me, Tom?

DMP Four on, 2 seconds.

ACDR I'll get back to you.

SFE Roger.

SCDR In 4-1/2 minutes, we are going to photograph Apollo at range 130.

ACDR (Thank you.) At 1 what?

CMP At range 130, I think he said.

ACDR (Repeat, please.)

SCDR Soon, we are going to follow your work.

ACDR That's it. 2, 9 - -

18 21 03 ACDR 3. ... guidance; in time!

DMP Big, bad - -

ACDR Start getting it!

CMP 3 seconds - -

ACDR Get - get it in FREE, pitch rate.

18 21 11 DMP Going FREE.

SCDR 4 minutes.

DMP ... Tom? ...

SFE Okay. If you be finished, we are going to finish your work.

ACDR (...)

DMP Don't think I do. ...

CMP Yawing.

DMP Big yaw.

18 22 06 CMP Off. ...

DMP Okay; now. Okay. You got it? ...

18 23 16 CMP 51:30, about 4 minutes.

# TIME SKIP

19 14 20 CMP Check out the ...

ACDR ...

CMP ...

ACDR Process the VERB 49.

19 15 00 ACDR ... Okay. ABSORPTION POWER, OFF and COVER, CLOSED.

DMP ...

CMP ...

DMP ... close the ...

19 15 20 ACDR Why do we ... with out-of-plane angle? Why in the hell are we closing the covers ...?

CMP Oh, ... getting ...  
 ACDR Yeah. No. That's right. ... has a question. ...  
 19 15 41 ACDR Houston, Apollo.  
 CMP ... checklist, Tom. ...  
 ACDR ... out-of-plane data attitude. Shit! ... power ...  
 CMP Okay; what's next?  
 ACDR ... out-of-plane maneuver and then ... Flight  
 Plan. 103.  
 CMP ... the urine dump?  
 ACDR ..., right?  
 19 17 06 CMP ... 37 - It's supposed to be ...  
 ACDR ...  
 CMP ...  
 ACDR We're 102:50. ... out of plane ... 102 ...  
 CMP Yeah, ...  
 ACDR ...  
 DMP ... two ...  
 19 18 30 ACDR ... gimbal lock. ...  
 CMP 45 degrees. ... Okay.  
 ACDR We already closed these covers ... okay ...  
 CMP We're not on ATS.  
 19 20 03 CMP After the maneuver, ABSORPTION POWER, OFF ...  
 ACDR ... yaw?  
 CMP 249.

19 22 01    CMP        Power down BMAG 1.    ...    Okay.  
 19 22 10    ACDR        MARK.  
 19 22 11    CMP        MARK.    ... BMAG ...  
 19 40 58    ACDR        ...  
             CMP        Is that a star out there?  
             ACDR        No, that's urine.    (Laughter)  
             ACDR        Yeah.    ...    Sure, I thought it was ...  
 19 42 10    CMP        Well, Myrtle's shaping up.  
             ACDR        I'll tell you, this urine system ... a hell of a  
                          lot better than ...  
             CMP        Have any - ...  
             ACDR        Yeah.    The ...  
             CMP        ... where it ought to be.  
             ACDR        ... in A-5.  
 19 45 45    CMP        Oh.    I see.  
             ACDR        ...  
 19 48 16    CMP        He went over to ...  
             CMP        I think.  
             CMP        Yeah.    Yeah.    Oh.    That's right.    Oh.    I got that  
                          out ...    Okay.    You know - ... before we get ...  
                          we have to get all that stuff stowed away.  
 19 49 04    CMP        Yeah.    I know ... bring small ones and the ...  
 19 49 47    CMP        Yeah.    A-5, I guess, is where bags are.  
             ACDR        ... bags, yeah.    We got bags.    ... bags.  
 19 50 20    ACDR        Let's see, where's ...

CMP Oh. You're looking for ... I thought you were looking for film bags. Okay. ...

19 53 49 CMP ...

ACDR ...

19 54 21 ACDR Deke, ... think you can get that bag down?

ACDR You want to play that on Alexey?

CMP Girls' showers. Yeah, why not.

ACDR Why not. (Laughter)

CMP Wonder where ...

ACDR ... it right up there ...

ACDR You ready?

19 57 30 CMP (Soyuz, Apollo.)

19 57 35 SCDR Go ahead.

19 57 38 CMP (... party.)

USA (Recorded sound effects)

19 58 51 SCDR ...

ACDR (...)

SCDR ...

MS (Laughter)

19 59 01 SCDR Did you hear it?

CC-M (...)

MS (Laughter)

19 59 11 DMP ... Alexey.

19 59 57 MS (Laughter) ...



20 00 06 CMP Oh, what are we going to do tomorrow. (Laughter)

DMP ...

ACDR Yeah. They sure did.

DMP Roger. ...

SCDR Apollo, Soyuz.

ACDR (... We read you, Soyuz.)

20 01 41 SCDR Why - you have ...

ACDR (...)

CMP (Okay; I understand.) Wait, wait. Wait, wait.

SCDR Okay.

20 02 32 ACDR That's okay.

ACDR Okay.

SFE (Moscow, Soyuz. How do you read?)

SFE (We performed loading at 10 - 22 hours, 55 minutes; 21 ... 1 hour, 21 hours, 55 minutes, 22:55; voltage, 27; charge, 21; and load, 20. Everything onboard functioning normally.)

CMP ...

20 04 28 CMP That's good.

ACDR That ... good.

USSR (...)

ACDR ...

SCDR ... (Yes, yes. ... disconnected; connected it to connector 12 in the OM.)

USSR (... turned off. FM simplex remains.)

USSR (Now ... we are getting ready to perform.)

20 06 08 CMP ... make ...

USSR (The capacity is 164, primary RCS is 88, and backup is 20 kilograms.)

20 06 58 USSR (... from 0.34 to 0.41.)

20 07 14 USSR (...)

# TIME SKIP

21 24 41 CC-H Apollo, Houston. Goldstone for 6 minutes.

21 30 22 CC-H Apollo, Houston. We're 1 minute from LOS Goldstone; Newfoundland in 5 minutes from now.

# TIME SKIP

22 21 03 USSR (Is the picture all right?)

USSR (...)

22 21 18 USSR (Is the picture all right?)

22 26 14 CMP They're all joint activity ... And 9, 10, 11, and 12 are ... Soyuz. U.S.S.R.

ACDR Okay. Well that's half of the obs stuff. The other Nikon thing - the other Nikon ... ..., Valeriy. I finished ...

22 26 45 CMP Yeah. The one I got out - the ones I took yesterday were - You finished them up. Those ought to be good.

ACDR Yeah. ...

CMP Okay. And we've got one more if I ever find the camera. Okay, but how about these CIs, 104 and 112?

ACDR Well, I've got enough ... 5, 6 ...

22 27 47 CMP I'm going to check off the ones we're calling. Okay. You've got 3, 4, 5, 6 and what? 7?

ACDR I got 5 - got 5, 6, 4, 12, 7.

ACDR 2, CI03.

22 28 36 CMP Just a second. I got ... Okay, 2 and what?

ACDR Got CI03. 3.

CMP Yeah.

ACDR 4, 5, 6, 7 - -

CMP Yeah.

ACDR - - 12.

CMP Okay.

ACDR ... exterior.

22 29 01 CMP Oh. Well, 02 we don't need. That's DM checkout.

ACDR That's right. ...

ACDR Here's the exterior ...

22 29 15 CMP Okay, just a second. Okay, call one out, and I'll see what it is.

ACDR CX01 ...

CMP Okay. That's TD&E.

ACDR ...

CMP That's dock. Okay.

22 29 29 ACDR 3.

CMP Okay. That's test undock.

ACDR 4.

CMP That's Soyuz photos.

ACDR 5.

22 29 38 CMP 5 shouldn't have been used; that's for entry.

ACDR Okay.

CC-H -- minor pad changes for tomorrow's ... we can get to work on them as soon as we can.

22 30 11 CMP Okay, understand.

CC-H Okay. See you at Hawaii.

CMP Righto.

ACDR I got a bunch of ...

CMP Aloha.

22 30 27 CC-H Aloha.

ACDR Okay, Vance. I got that stuff down in A-5 for us. ... 2 we used for Earth obs.

CMP Okay.

ACDR Now, that --

22 30 40 CMP Yeah. U-2 is getting too crowded.

ACDR Yeah. We'll put that in the last ... got all that film ... that PAO ...

22 30 49 CMP A-5. Nothing else in A-5?

ACDR ... Nothing much.

CMP Make that other ... the bottom sack ... Okay. Do you want to check off the rest of the things, though? Like, we never went over the HRC and --

22 31 08 ACDR Which ... do we have out of the Hasselblad ...? I got a bunch of them ...

CMP Yeah.

22 31 12 ACDR Let's just mark that one ... CX12 ...

CMP Okay, now that - isn't that the one we had on today, or what?

ACDR No, that's the one ... I shot all those ...

CMP Uh-huh.

ACDR ...

22 31 29 CMP Oh, that - oh, I took the - took it off and I guess you put it back on.

22 31 31 ACDR What?

CMP ... just didn't have any magazine on ...

ACDR ... I'll put ... CX ...

22 31 43 CMP Yeah. And after that, today we put 55 on here, and I looked at it and I thought, well, that's quite a bit ... quick release on it, so I pulled it off.

ACDR Yeah.

CMP I gave it to you and put it up ... warmed up this camera.

ACDR You gave it to me and I shot ...

ACDR Yeah. You want this? ...

22 32 41 CMP Ahh, I'm going to look at M-2 to be sure just what I'm talking about. But today, after all the big action, I took off a magazine.

ACDR Oh, you did?

22 32 52 CMP I - I think I did cause it had 55 on it. Maybe ...

ACDR No. No, it wasn't. I looked at it. ...

22 33 08 CMP Yeah. Let's look in there.

ACDR Go ahead.

ACDR ...

22 33 13 CMP You and I are doing okay. We got this to do until 106:50. But we do need to be set up ATS. ... Pitch 23, yaw 299.

ACDR Okay.

CMP ... Okay. ... Next thing we got is a UVA roll scan and Deke's off doing his ... We'll do that - start it around 50; we got a half hour or more yet to make sure the ..., I guess.

ACDR ...

22 34 54 CMP Yeah. And that's what they want the most, I think. PAO quick release is not movies but it's ... Tell you what, you go down and ...

ACDR ... have to go to that P20.

22 35 29 CMP No. I don't think we want to do that until we get close.

ACDR Is there exact time to proceed on that?

22 35 38 CMP Well, you know, that's one of those dealies where we'll pull out the supplement, probably. I - I don't know. I'll have to check. The exact time is someplace. We do have some raster scan EMP stuff tonight.

22 36 11 CMP Yeah. I know I put that - that thing - -

ACDR Did you change it out after ...

CMP Yeah. I know I put it over here. ... just see where it is.

22 36 25 ACDR Yeah. That was the one that ...

22 39 26 ACDR Yeah. ... we have ...

CMP I got a feeling - unless - except there are five more frames than when I took it off. Let me see if there's another one.

CMP Okay. That one's -

CMP You know I think I finally discovered why they never like to have us shoot all the Hasselblad stuff mixed. Because probably the ... figures once the PAO guys get it, you'll never see it.

ACDR Yeah.

CMP Well, I don't know. Let's see what this says, docking - Yeah. I - I wrote on there, docking TV, - -

ACDR Oh.

CMP But I meant film. Well, anyhow, that's good.

22 40 56 ACDR Why don't we get another bag - we'll have - we'll have two bags full.

CMP Okay.

ACDR In the second bag, there's some other stuff. That was the one we took off, and I think this is the one that I popped 35 on. We haven't been shooting much today and - on ...

CMP I - maybe shot a half a dozen times. You know - -

ACDR Okay.

CMP - - when we went over Africa, and we saw ... - -

ACDR Yeah.

CMP - - that Levantine Rift.

ACDR Yeah. I know you said it. Okay. Well, all the rest of the stuff - you got - you got the camera?

CMP It's up in its usual spot probably.

ACDR No, it's not.

CMP Oh.

ACDR There it is. All right. I shot about - at least three sites.

CMP Okay.

ACDR Suppose to put these two on. That should have what we got on ... the Hasselblad. There's still a bunch left in there. Okay. Should we get a little - another - -

CMP Okay. You say you want to - somewhere to put this, so we'll have it for a quick release?

ACDR Yeah. That one - that bag is all filled.

22 42 53 CMP Okay. I guess we need another bag. And - -

ACDR You might check down in A-5 there, any of them will do.

CMP Yeah.

ACDR Just so it'll hold a couple of these.

CMP I guess what I'll do is just get a Hasselblad bag out of B-5.

ACDR Yeah. That's a good idea. You know, where's that - looking ahead in the Flight Plan, we have a mapping pass and a visual obs pass.

CMP Yeah.

ACDR Do you know where that big Hasselblad is?

CMP The mapping Hasselblad?

ACDR The black one - yeah, the black Hasselblad.

CMP No. The last time I even thought about it, it was over on that corner over there. I don't - I - I wouldn't suspect it's in the TSB back there, but I don't know.



22 46 04 CMP Okay. I'm going to designate this one "PAO quick release."

ACDR Okay. ... camera ...

CMP That's probably all.

ACDR Yeah. It's my option ... tell them that.

ACDR Shoot. I've lost at least two pencils. ... let me find one.

CMP Maybe I got an extra. Oh, yes. I got a - I found it somewhere.

ACDR ... contact the ...

22 47 14 CMP Okay, tell you what. We'll - I'll put this down with that other - Hell, did you lose the pen too?

ACDR No, I got it. Say, I'm missing one Pentel.

CMP I got a - -

CC-H Apollo, Houston. We're 1 minute from LOS Hawaii. We'll see - see you when you get locked up on the satellite.

CMP Okay.

ACDR Put it on 10 over 40. 4.

22 53 40 ACDR Got it.

22 53 56 ACDR Okay. On 808, is that thing hooked up? Is the cable hooked up? Just pull the camera around to make sure it's the right one. Okay. On 808, the CAMERA SYNC to CM/DM ...

22 54 30 DMP TV SELECTION, select DM, DMI.

DMP DMI STATION POWER, ON.

22 54 45 DMP I go to 181; I'll take care of this on 181. Next thing you do is obtain the wicking demonstration. I'll go down to 181 and set that up for you.

22 54 59 CMP Can I help?

ACDR No. ...

CMP Okay.

22 55 08 CMP Well, maybe three is too many in the way. Need me to read your checklist to you while you're doing it?

ACDR ... CM POWER ... That's what I'm going to do.

DMP Come on up, Deke.

22 56 35 ACDR Okay, the next thing. Obtain wicking demonstration. Mount baseplate on food tray, third Velcro row.

DMP ...

ACDR Mount baseplate on food tray, third Velcro row.

DMP Okay. ...

22 58 13 ACDR Mount baseplate on food tray, third Velcro row.

ACDR Obtain yellow syringe, attach yellow ampule. Yellow syringe, yellow ampule.

22 58 55 ACDR You want a bag to put this stuff in?

ACDR ... yellow syringe. Obtain yellow syringe, attach yellow ampule.

ACDR Fill baseplate with water, holding the syringe vertical. That mean water out of the gun or out of that?

22 59 48 ACDR Portable light, high; and DAC, on.

ACDR Fill baseplate with water, holding syringe vertical.

DMP ...

23 01 16 ACDR Portable light, high; and DAC, on. Panel 400. VTR POWER, ON; HEAD WHEEL DRIVE MOTOR, ON; and RECORD.

DMP ...

ACDR Yeah. ... wait until ... halfway up before you -  
Wait until I turn this on.

23 02 08 ACDR VTR is coming ON, HEAD WHEEL DRIVE MOTOR, ON and MODE  
RECORD. Shouldn't this have a green light, Deke?  
Vance?

CMP What's that?

ACDR ...

23 02 23 CMP RECORD? Yeah, it should have a - -

ACDR Green light.

CMP - - green light.

ACDR When I go to RECORD, I get nothing.

CMP Did you go to HEAD WHEEL first?

ACDR Yeah. The HEAD WHEEL DRIVE is already ON. ...

CMP Did you get it?

ACDR ...

ACDR Okay, Deke. You all ready? All right. Just turn  
the DAC - portable light, high, and DAC, on. Then,  
after I've got that, place wicking assembly 1 on  
baseplate..

ACDR ... number 1.

23 03 32 ACDR DAC, on.

ACDR Okay. After wicking has proceeded halfway or 3 min-  
utes' duration, remove - remove the wicking assembly  
and discard; it says fecal bag. ...

ACDR What was that?

ACDR The TV camera shooting the ...?

DMP I don't think so.

23 05 10 ACDR After wicking has proceeded halfway or 3 minutes, discard wicking assembly ... Repeat steps 7 through 8 for wicking assembly 2. ...

ACDR Vance, how you doing?

CMP Okay. I'm just looking ahead on something ...

ACDR ... what film bag ...

23 06 14 ACDR Discard ... Okay. Repeat steps 7 through 8 for wicking assembly 2.

23 07 04 CMP That ... roll scan does kind of have me puzzled.

ACDR That damn that portable light's in the way.

CMP Oh, no, it doesn't. We've got the UVA on now. That's right. ...

23 07 52 ACDR ... supposed to be looking at the ...

CMP ...

ACDR ... portable light.

23 08 27 ACDR ... turn on the DAC.

ACDR ...

23 08 50 ACDR Okay. After that you clean baseplate with tissues and place it back on the tray. Obtain the black syringe and ampule. Fill the baseplate with oil ...

ACDR Clean the baseplate ... if I turned the DAC off ... Clean baseplate with tissue ... back on the tray. ...

ACDR ...

23 10 08 CMP Yeah.

ACDR ...

23 10 21 CMP Nope. Not quite yet. Almost.

23 24 18 CMP Yeah.  
ACDR ...  
CMP That's what we're ...  
ACDR That thing is starting to shut the ... down. ...  
23 25 01 CMP Yeah. That's no ...  
ACDR ...  
CMP Kind of like ... Myrtle once she closes those doors.  
ACDR Yeah.  
ACDR ...  
23 25 38 CMP Probably. Yeah. Close the doors ...  
23 27 04 SFE (Is the picture all right?)  
USSR (Soyuz 2, how is the picture?)  
23 27 31 SFE (Yes, how is the picture there?)

# # #

DAY 201

00 47 47 CMP ... back in here. ... That's where we were having all the problem.

ACDR Yeah. That's where we been ... all those problems.

CMP Okay. You understand.

00 48 07 CMP So after this we can power down and then hit the DSE and all that. I wonder how long they want you to do this.

ACDR ... ATS. No we're not.

00 48 22 CMP Dick, how long do you want this raster scan to run?

00 48 29 CC-H 6 minutes, Vance. And we're about - you'll get a flashing "37" when it's - when it's done, and you're - and after that you can go ahead and do the next maneuver. We're about 30 seconds from LOS and Ascension comes up at 108 plus 40.

CMP Okay.

ACDR High bit rate ...

CMP Huh?

00 48 48 CC-H And, Vance, one reminder. We'd like you to acquire the ATS as soon as you get in attitude.

00 48 54 CMP Okay. Okay, let's see. What's that about high bit rate?

ACDR ...

CMP Okay. You were saying something about high bit rate?

00 49 04 ACDR Oh, high bit rate.

CMP Well, at the end, all you do is go stop, and there's a - no, no - no, no - not yet.

ACDR Oh. We've got to stop for ... here.

00 49 17 CMP Well, but if you have to start ...

ACDR ... stop, stop.

00 49 26 CMP Okay. ...

ACDR ...

CMP Okay.

00 49 43 CMP Houston, Apollo.

ACDR Check off this ...

00 50 27 CMP Okay. We got ... in the ...; we got to set this attitude after the next ATS. Minus 64, 292; 121, it's right away after the maneuver.

ACDR Minus 64.

00 51 34 CMP \*\*\* ATS ...

CMP Don't close WASTE STOWAGE VENT valve until 109:29. Hey, that's because, I think - I wonder if that's open now. They think it's open, I guess. We did that purge last night. I'm sure it's ... I wonder if it's open; probably not.

00 52 00 ACDR Purge?

CMP Yeah. ... that - the - you know that purge valve we were supposed to have in there?

00 52 04 ACDR That 90-degree elbow?

CMP Yeah. I don't know - -

ACDR It's there.

CMP Okay.

ACDR It has to be open. ...

00 52 10 CMP Yeah. We - you know, we closed it not - I guess - We had to had [sic] a purge valve or I wouldn't question ... a purge last night.

ACDR What about the battery? Did it ...?  
CMP It should be open.  
00 52 29 CMP Tom, the urine thing ought to be closed.  
ACDR WASTE STOWAGE VENT's closed, ...  
CMP And, let's see, got a LiOH canister change.  
ACDR ... to take a couple of hours.  
CMP How'd it work out? Reasonably good?  
00 53 18 ACDR ... the raster scan going. Okay, flashing "37".  
CMP Okay.  
00 53 29 CMP Okay. EUV powerdown and X-ray powerdown.  
CMP And, as soon as you do that, I'll configure the DSE.  
ACDR Okay.  
00 53 50 ACDR EUV powerdown. TELESCOPE POWER, OFF; COVER, CLOSED.  
CMP Let's see, STOP and then REWIND, FORWARD.  
ACDR Okay. X-RAY PURGE, CAL and hold it for 30 seconds.  
00 54 56 ACDR ... LOW POWER, OFF, center ... Okay, you're shut  
down.  
CMP Okay.  
00 55 37 CMP Oh. Did you go STOP and COMMAND RESET ... VERB 49?

TIME SKIP

01 25 08 ACDR This God damn thing keeps counting and we got ...  
CMP Are you running, Tom?  
ACDR Yeah.



CMP Do you want me to reset it or anything?  
 CMP Roger.  
 DMP Okay. Now we got that fifth ... we do not maneuver  
 on the 58 deal, on that P20.  
 CMP That's right.  
 01 25 36 ACDR That's old DAP coming back in ...  
 CMP Yeah.  
 ACDR Counting up.  
 ACDR Okay, and then we go - we stationkeep and go to a  
 P20 after. Yeah, okay.  
 CMP All right.  
 CMP Okay, that's - this film, ... talking about.  
 ACDR Okay.  
 CMP On the FDAI[?].  
 ACDR If you got time, why don't you go down there and  
 stationkeep.  
 CMP Yeah.  
 ACDR You got the film for docking? ... docking ... The  
 main thing is we can get it ...  
 CMP Get the camera.  
 ACDR Okay, I've counted up 3 ... here.  
 DMP What's left?  
 01 26 15 ACDR Thank you, Vance.  
 CMP Yeah.  
 ACDR Here we go.  
 CMP ... clock.

ACDR Okay.

01 26 22 ACDR ... AUTO.

CMP Okay, ... VERB 58.

ACDR You got a VERB 46 in there?

CMP Yeah.

ACDR Okay, VERB 58.

CMP Okay. We'll wait till this maneuver - -

01 26 33 CMP Okay, GO for the burn. Good. ... got to be sure ...

ACDR Yeah.

ACDR Okay. And 40 seconds, Deke.

DMP Yeah.

01 26 55 ACDR Body diameter's about 8 degrees. THC forward;  
1-1/2[?] feet per second on EMS[?].

CMP Okay; ready for the THC.

CMP Ready?

01 27 07 ACDR THC POWER on?

CMP Ready?

ACDR Yes.

CMP Ready?

ACDR Go.

CMP Now try it.

ACDR God damn ...

CMP Is it working?

ACDR EMS isn't working.

DMP Sure you got it in NORMAL?

ACDR What the hell's going on?

01 27 19 CMP It's thrusting.

ACDR Is it?

01 27 20 CMP Yeah.

01 42 17 CC-H Apollo, Houston through Guam for about 6 minutes.

01 42 23 CC-H Roger. Vance, this is the way - I have a feeling that you guys - -

01 47 58 CC-H - and a yaw of 258, and we need to get those.

CC-H Okay. And we're satisfied with the evaporator now. We'd like the SECONDARY COOLANT LOOP PUMP, OFF. Incidentally, we're about 20 seconds from LOS. I'm going to be standing here - standing by here on these upcoming next couple of STDN passes and also on ATS, and I've got some news here that I haven't had time to read to you tonight. If you'd like to hear it or talk about anything else, just give me a call when we get locked up per the Flight Plan.

01 48 39 CC-H And if I don't hear from you, have a good night's sleep, and we'll see you in the morning.

CMP Okay. Ordinarily we'd like news, but ... in the morning. ...

01 48 49 CC-H ... great. I'll still be here so I'll - I'll be - I'll have it in the morning. See you then.

CMP And Deke ...

01 49 08 CC-H I'm sorry, you cut out. ... say again.

CMP Okay. One last thing, ...

01 49 39 CMP I don't think I got it ...

01 51 27 CMP ... think it's ... 109:32:32.

TIME SKIP

10 19 07 ACDR 177.

10 19 13 DMP UP TELEMETRY to RELAY.

ACDR Primary evaporator ...

DMP I'm sure ...

ACDR Where's that water ... outlet at?

10 19 37 CMP It's right down here at the bottom - kind of at the foot of the hatch, on one side. Here. Climbing in. No. As you climb in the hatch, down and to the left.

ACDR ...

10 19 50 CMP Yeah - No. No, that's - that's the urine and the waste water dump. Let's see. It's down - still in that area. Only it's a little more to the left, I think.

ACDR ...

ACDR Tastes delicious with lettuce and cheese on it.

10 20 18 CMP You have to be real careful of it, but it's the best thing I've tasted up here.

CMP Okay, it's 20 --

ACDR STOP and REWIND?

10 20 38 CMP Yeah, STOP and REWIND, COMMAND RESET.

#### TIME SKIP

10 52 11 DMP Yeah. Tom's up there right now. Why don't - why don't we do that.

CMP ...

DMP Here's something for us, get it right now. ...

CMP Yeah. I never heard before that.

ACDR Right there. Baseline, go up and ... correct ...

CMP Yeah. ...

ACDR ...

CMP What are you doing?

CMP ...

CMP Okay. ...

DMP What does it say?

CMP It says, ...

CMP Okay. ...

DMP ...

CMP ...

10 55 25 DMP Yeah. Once I ... post[?] photos ... photographs ...

DMP ...

DMP Then later ... indicators are ... black ... territory ... light ... There's a lot of ... things like ...

CMP Yeah.

DMP It's very ...

ACDR Okay. ...

DMP What's it say here, Tom?

ACDR ...

CMP ...

DMP ... where we are. ... plus the ground ... where we really are. Now that's ... one light period, ... there's another period ... that free period of photographs ... that ... got those photographs ...

ACDR ...

DMP ... good angle on it that's why ... to follow ...

DMP ... beyond that it just ... got a very - double ... somewhat ... different areas from the other ... light, ... parallel.

10 59 23 DMP In other words, one of the best ... goes up and re-places ... go back and turn parallel to ... I guess it's ..., it ends at the bottom ... the second ... And, ...

CMP ...

DMP I can swing clear of the ... right in the ... ball-park ... So the overall pattern of 1, 2, 3 ... and I think ... photos from an area around ...

ACDR ...

DMP Yeah.

DMP We didn't just find ... we had about ...

ACDR ...

ACDR Okay, let me have your ... That all the ...?

DMP ...

CMP ...

DMP Except for one ...

11 06 01 DMP You got - you guys got ... squared away?

ACDR I'll be - I'll be ...

DMP ...

ACDR ...

ACDR Vance, ... medication?

CMP ...

ACDR Deke, you got any medication?

DMP No.  
 ACDR Okay. How about water.  
 DMP There's ... plenty.  
 ACDR ...  
 ACDR Vance, I think you got a bad cigar going.  
 CMP Well, you just ... (laughter). ...  
 DMP Glad I got my ...  
 CMP ... no way.  
 ACDR I'm going up to 6.  
 ACDR 5.  
 DMP You going up ...  
 11 08 10 CMP That's - Yeah, that's a light ... two or three ...  
 ACDR ...  
 DMP ...  
 CMP Yeah. We ought to ... back ...  
 ACDR ...  
 ACDR I've been in some ...  
 11 12 29 CMP Yeah. It was kind of ... last night.  
 ACDR All right.  
 CMP Yeah.  
 ACDR ...  
 CMP ... the only thing that we've got on ...  
 DMP Well, Soyuz ...  
 CMP The only thing that's ... turned off after the un-  
 docking ...

ACDR ...

CMP Deke.

DMP Yeah.

11 14 01 CMP You remember when we turned ... docking lights. We turned them off.

ACDR ...

DMP But is there a ...

ACDR ...

CMP What?

ACDR ...

CMP Yeah. They both ...

ACDR They both ...

CMP ... that's when we - that's where we finally get that ...

ACDR ...

CMP Yeah.

ACDR ...

CMP Yeah. I know - -

ACDR ...

DMP Tom, ... in about 5 minutes.

ACDR Okay. ...

CMP Tom.

ACDR That's right. You go in front of ...

CMP Yeah. ...

ACDR ...



11 16 16

DMP Vance.

CMP Yeah.

DMP ...

ACDR ... the whole thing?

CMP Well, how's Tom ... without those frequencies ...

DMP ... That's not very true for me.

ACDR ...

CMP Okay. Remember -

ACDR ...

CMP Yeah.

ACDR ... five of those.

DMP I could hear the ...

ACDR Yeah.

DMP I looked over there, I could hear it pop, pop, pop.

CMP That's it.

ACDR ... You're okay.

CMP ...

DMP Yeah. I never tried to ...

CMP But I saw your - -

ACDR ... may have to turn this ...

DMP ...

CMP I - I think the only thing it could be, is that, somehow or another that ... just cut off. ... RCS.

ACDR ...

CMP Well, don't you remember, though, ...

ACDR Yeah.

CMP You remember looking down in that ...?

ACDR ... The way that turns off ...

DMP ...

ACDR ... That's how I put it. ... Up here ...

DMP ...

CMP All I remember is, those ...

ACDR ...

CMP And - And then I started looking for some film and - -

ACDR That's just - -

CMP - - I said I'm going to ...

ACDR ...

ACDR Yeah, then that ... that's the ...

DMP ...

CMP Try ... to the first and then later ... Well -

ACDR ...

11 18 48 DMP You're right. I kind of had a ...

ACDR ...

DMP ... Yeah. ...

DMP Well, I don't think ... would be ... got down through here.

ACDR ...

DMP I tell you what. You go ahead and with your ...

CMP Right. ...

DMP Great. Let's do it ...

ACDR Let me ...

DMP ...

ACDR ...

DMP ...

11 21 45 CMP You want hot?

ACDR Yeah.

ACDR ... and rates 22.

DMP ...

ACDR Right. ...

11 25 15 ACDR ... seconds to go. 100, 205. ... 100 ... the first time. ...

11 32 28 ACDR ... set up in the same place ...

DMP Okay.

ACDR Let's see, ...

DMP ...

ACDR ...

CMP Stars.

CMP Did you see it ...

DMP ...

CMP Thruster.

ACDR ...

CMP Let's poke around in here ... from where we know we can ...

ACDR ...

CMP Yeah. I'll - I'll put it in this TSB ...  
 ACDR ... that burn.  
 DMP Yeah. It's suppose to be 22.  
 ACDR ...  
 CMP Wonder if we can ...  
 DMP ...  
 ACDR ...  
 11 34 47 CMP That's right, ... So that's correct.  
 CMP I still think you're wrong ...  
 ACDR Okay. ... Ready?  
 DMP Yeah.  
 11 36 29 CMP Okay. You got it solved.  
 ACDR ... problem ...  
 DMP ...  
 CMP 4 ...  
 CMP 4 and ...  
 DMP Tom, you got it?  
 ACDR Not yet.  
 CMP 314.  
 DMP Tom.  
 11 39 21 ACDR ... .. see that fucking alinement.  
 CMP Pardon?  
 ACDR Did you see that son-of-a-bitch go to ... See  
 there, I got to go back ...

↓

CMP        Okay. ...

ACDR       ...

CMP        Okay. Look for a ...

ACDR       ...

CMP        Okay. Here's what we did ... And the other side of  
the tape recorder's fixed.

ACDR       Okay. Where's the Flight Plan? Here it is ...

CMP        Yeah.

ACDR       We got to go back and pick up that ... there's an  
option it says here.

DMP        Okay.

ACDR       ... 05566.

CMP        Is that all?

ACDR       That's ...

CMP        Zero, what?

ACDR       ...

DMP        Did you read ...?

ACDR       ...

CMP        ...

ACDR       ... Right.

11 41 52   CMP        Okay. I thought it was a ...

ACDR       Yeah.

DMP        Right.

CMP        Still got time to do this ...

ACDR       ...

11 44 55 CMP Three lights.  
11 45 26 CMP Okay. I figured we have dehydrated grape and orange ...

TIME SKIP

12 39 36 CMP You - you got ... Did you get it?  
DMP One ... five ...  
ACDR You, that should make eight.  
CMP That's ...  
ACDR It's going to be too hot for ... to ...  
USA Okay.  
12 42 13 CC-H Apollo, Houston. We're AOS at Guam for 6 minutes.  
ACDR Roger.  
USA Oh, shit.  
ACDR Okay, ...  
CMP ...  
ACDR ... that's the first ... shave ...  
MS (Laughter)  
12 45 26 CMP Either that or start a beard.  
12 46 08 CC-H Apollo, Houston. I don't know whether you got my last call regarding it, but on the GLYCOL EVAPORATOR WATER FLOW valve - we need to make sure that's in the OFF position. That's center, OFF.  
CMP ...  
CC-H The reason for that is that we're - our data looks a little bit funny down here now.

ACDR GLYCOL EVAPORATOR.

CMP Page ... 7.

12 46 30 ACDR Okay. We had the switch in the wrong position. Because of the position here, it's hard to tell whether it's center OFF or ON.

CC-H Did you have it in the ON position?

ACDR Yeah. Sorry about that.

CC-H Okay, fine. Thank you.

12 47 07 CC-H Apollo, Houston. We're 1 minute from LOS. Next station contact is Santiago in 32 minutes at 120:57 - 120:57.

ACDR Okay.

ACDR It's almost 11:25[?].

CMP Okay. ...

DMP ...

CMP Yeah.

ACDR ... when you get ...

DMP Yeah, it does kind of start to settle down.

ACDR Yeah, yeah.

ACDR ... DAC.

12 49 51 DMP How was that docking module last night?

DMP Yeah; well, that ... was just right.

12 50 12 ACDR Yeah. ...

12 50 14 DMP (Laughter)

12 50 24 CMP ... I forgot. I remember waking up ...

12 50 35 MS (Laughter)

CMP Okay. We're there ...  
 DMP ... check ...  
 DMP ... in about 25 seconds.  
 CMP ... I don't like having to rush it.  
 CMP ... have to change ...  
 CMP ...  
 ACDR Yeah.  
 12 53 21 CMP And VERB 21 ...  
 DMP Why don't you ...  
 DMP Boy, this tea looks ...  
 CMP ... on the ground I like coffee; here I like tea.  
 CMP ... the flavor ... it's hot ... cold.  
 CMP Okay, Deke ...  
 USA (Yawn)  
 12 55 47 ACDR ...  
 CMP It's a real ... get a tiny bit more ... gave me a  
 tiny bit less, could manage it all real well.  
 CMP One thing they can ... interaction.  
 DMP No. ...  
 CMP ... woke you up ...  
 DMP ... floated off ...  
 12 56 54 CMP Okay, next.  
 DMP Is the tape recorder ...?  
 DMP Do you have it on?



CMP I've been looking for a plain ... a plain ...  
 CMP ... Earth obs ...  
 ACDR ... if we have a ...  
 13 00 37 ACDR ... the only place I got hot was in the ...  
 CMP (Laughter) Yeah.  
 CMP Before we go down, we ought to take a ... flash picture ...  
 13 01 11 ACDR We got an interior film for the DAC[?].  
 CMP Flash[?].  
 DMP ... almost ...  
 CMP Okay.  
 ACDR ... around here at one time.  
 13 03 16 DMP Did you look back here? I thought I saw ...  
 ACDR Do you have that cue card for out the window stuff?  
 I wonder if we want to start - start shooting ...  
 13 03 55 CMP Might as well.  
 ACDR I shot a bunch of pictures ...  
 CMP I think ... we are ...  
 13 04 32 ACDR (Laughing) Yeah, yeah. I saw the same thing.  
 13 04 42 DMP ...  
 13 05 53 CMP Strobe light - strobe light's ... I think down here in the -  
 CMP Did you find it?  
 ACDR ... flash?  
 13 07 44 DMP Okay. Shut it down ... I'll get that stuff shut down.

CMP ...  
 CMP ... ZFF.  
 13 09 30 ACDR We got the ZFF with the other one.  
 ACDR What?  
 ACDR Yeah.  
 ACDR ... last night ...  
 13 12 57 CMP Okay; you're going to get the ... off aren't you?  
 CMP ... I'll have to turn the ... off ... not quite yet ...  
 13 13 12 CMP It'll be in about 5 seconds. STOP, REWIND, COMMAND RESET.

#### TIME SKIP

14 15 20 CMP Oh, shit!  
 ACDR Crip, how do you read?  
 DMP I can't figure out what's going on here. I heard him say something.  
 ACDR Crip, how do you read?  
 DMP He's trying to talk to us.  
 CMP What made it go off?  
 DMP ... know.  
 CMP Are we in PRIMARY or SECONDARY SERVO, now? Do you know?  
 ACDR I don't know. Everything was okay, I think.  
 DMP Right. ... Yeah.  
 CMP Try it there.

ACDR No. It's got to be above that. Crip, how do you read?

ACDR It's got to be above it, 50 percent.

CMP Okay. Might make it if we hurry.

ACDR I wish you - -

CMP Oh, yeah.

ACDR Verify ... - -

CMP No, wait. This is going ...

ACDR Oh, yeah.

CMP And they say verify ...

ACDR Hold on.

CMP Okay.

ACDR Take a look at the lights ... tell when ...

14 17 27 CMP Okay. VERB 21 ENTER. Plus 14690, 1226 - -

ACDR ...

DMP ...

ACDR Oh.

CMP Well, you had it.

ACDR Okay.

CMP All you have to do ...

CMP Now.

ACDR 1226.

CMP There you go.

CMP Well, start having the ... running.

ACDR What happened, Vance?

CMP The TV went off.

14 18 35 DMP I just turned it off. It's supposed to be off ...

CMP Okay. The next one ... Verify DSE TAPE MOTION.

ACDR ... TAPE MOTION.

CMP TAPE MOTION's gray.

ACDR Okay. It's working all right.

CMP Okay. VERB 49 ENTER. Plus 1.0[?].

ACDR Plus ...

CMP 1.0[?].

CMP Okay. Think that problem is nominalist. Suppose to be in PRIMARY ...

ACDR Yeah.

CMP Put it - okay, HIGH GAIN, right?

ACDR Yeah.

DMP Well, SECONDARY is - In all that thrashing around, it went to PRIMARY and it dropped a ... out about 30 seconds then came back again. I don't understand that.

ACDR Well, let's see ... set up. Vance, what time have you got? ...

CMP Yeah.

ACDR Okay. We're all set.

CMP We're all set.

ACDR The new high-gain angles for the next time - What's it say?

DMP Well, tell you, that's where I woke up; you see, I didn't realize you guys were running ...

ACDR Why?

DMP ... trying to get ahead for once ...

ACDR Pitch is 14 degrees.

CMP Okay.

DMP And - Yaw?

CMP 308.

CMP Well. That stands to reason. ... pretty rough.

DMP Yeah.

ACDR We have Orroral Valley coming up ...

CMP ...

ACDR We got ... coming up here in 1 hour.

14 20 56 ACDR You've got an exercise period after the P20 option 5 ...

CMP Have to - I don't think ...

ACDR Let's don't - You're the only one that has to do it.

CMP ...

ACDR ... camera. ... shoot out the window. ...

CMP Okay. ...

ACDR ...

DMP See ... Tom's got ... to go.

ACDR ...

CMP Oh, yeah. As I recall ...

DMP ...

ACDR ...

14 22 54 DMP Well, that will be fun.

ACDR Oh, I'm sorry.

ACDR Deke.

DMP Yeah.

ACDR Could you hand me the ... CX14 ...

DMP ..., there.

ACDR ...

CMP Now what happens?

ACDR Ah - ...

CMP ...

14 26 48 ACDR X-ray powerdown. Okay.

ACDR Okay. You want the X-ray powerdown now?

ACDR Got that.

DMP Okay; X-ray's powered down.

ACDR ... would you ...

14 27 10 CMP Okay. HIGH VOLTAGE POWER is off.

ACDR Okay. All kinds of shit on the outside of that window. That's ...

ACDR Okay. 6.

ACDR ... else is ...

14 32 08 ACDR Quite a wobble.

DMP Yeah.

ACDR ...

ACDR Yeah, I ...

ACDR You want to try looking ...

DMP ...

ACDR Yeah, why don't you do that.

ACDR I'm getting 27 ...

DMP ... 32.

ACDR That's okay.

ACDR ...

DMP ...

14 39 40 ACDR Okay; low bit rate.

14 39 53 ACDR ...

CMP Okay. ...

ACDR ... I got a lot of these ... Yeah. ... space-  
craft ... aline. Okay. The next thing to do is  
power down, I guess.

14 40 25 ACDR Okay. Power down. TELESCOPE, OFF; COVER, CLOSED.

CMP ...

14 40 46 ACDR Okay. Yeah.

ACDR Yep. Next thing is ...

CMP ...

14 41 20 ACDR Okay. ..., AUTO.

CMP ...

ACDR Huh?

ACDR He turned it off.

DMP Yeah. I know, ...

14 41 49 ACDR Yeah. You ... Do that first. It has to be powered down.

DMP Oh. Power it down.

ACDR Power it down.

DMP ...

ACDR Yeah.

DMP ...

14 42 10 ACDR Yeah. Power it down. I'll just ... powered down, ... This obs thing is - really super for ... things on.

DMP ...

ACDR Is that ... We have ... box in there. We still have ... Hey, Vance, look at that ... Look out the window. ... got here. See that light ... over the ... horizon. Look at that. See the band ... see that band.

14 43 18 ACDR ... We get a ... band and a ... and a yellow band at the same time. Oh, we got a different attitude this time. ... we had last time. You don't ... Are we there yet?

14 44 01 ACDR Yeah. ... we got to have this ... down. Yeah, but not a hell of a lot more.

ACDR Yeah. That will be roll right?

ACDR Yeah. What? Yeah.

ACDR Yeah. Also, let me ... set up the ...

14 46 10 ACDR ... 61101. Let's set the ..., Deke. ... when you finish. I got ...

DMP ...

ACDR Yeah.

ACDR All righty.



DMP ...

ACDR 2030, ... Vance, you know we're upside down?

ACDR If you're upside down, the Nazca Plain, should be on the right. It says to shoot it upside down. They ought to be ... No, I'd rather have it right side up so the spacecraft is ...

14 49 50 ACDR Okay. Starting with the Earth obs, rev - revs 73 to 74. Coming up trying to find ... and trying to look for the Nazca Plain.

ACDR Yeah.

ACDR Put it ...

CMP Okay.

14 52 30 ACDR I don't like this attitude for Earth obs. I'd rather ... heads up and pitch down, like this. See? ... way down in here. See if it fits; don't have enough room. Let me look at this. Can't get down there.

14 54 06 ACDR Okay. On the map, ... rev 74, we're approaching the north coast of South America, Peruvian Desert, trying to find the Nazca Plain. The clouds go all the way up to the north of here ... Yeah. That's just the way a cloud ... We really should. Fire away. No, we're ...

14 56 31 ACDR Man, this attitude is fucked up, did you know it? It's really bad, you got to keep your head straight back like that and left, right, left. I'm going to have to change this whole son-of-a-bitch around. I really need my headset here. The only ... is the heads up. It's, let's see, you're like this trying to look ahead, just right and left. Then reverse this ... first. I think if we look down in here, which we ought - you can look down here, it's all right. You don't have enough room. Good heavens! ... got it down about like that.

ACDR Okay, who ... Yeah. Okay, ...

ACDR Okay. ...

14 58 33     ACDR     How do you read, Houston? Okay. Look. Get with Farouk. This attitude for visual obs, ... degrees. There's no room to twist your head and look upside down, and the whole thing ... you reverse this thing so they're - we're heads up and pitch down ... everything about twice as easy. Can you hear me? Okay. We want to roll 180 degrees for this - for vis obs. Not the mapping, but the vis obs ... Yeah. Yeah. ...

ACDR     We got some clouds over ... It goes west and ... cloud cover. Okay. The cloud cover is ... the west coast of the Pacific Ocean ... of the Nazca Plain, so ... sight of 7B. 7C is also covered over ... And ...

15 03 30     ACDR     Okay. UP TELEMETRY to RELAY. You already got that? UP TELEMETRY, RELAY?

ACDR     Houston, Apollo. Do you read? Okay. Did you get my last transmission?

CC-H     ...

15 04 14     ACDR     Okay. Look, I'm sure this was optimized because sometimes you do the vis obs at the mapping attitude. I'm now wings level. There - I've got a lot of cloud cover, of course, so I can't see much, so I'm not losing too much by talking to you. What we want to do is to - to ... for vis obs only to roll to heads up. Because if we could sit down behind the couch, this attitude wouldn't be bad. But the trouble is, there's not enough room to sit down behind the couch and look out where you're going. You can't get in there. You're too high. So we want to roll to heads up, pitch down, looking straight forward for the vis obs attitude when it's not associated with the mapping. Can you get Farouk and his troops tracking on that? Over.

CC-H     ...

15 05 04     ACDR     Yeah, this heads down; when you look out like that to get the view, you're - you're straining yourself up against the instrument panel, holding your feet in the struts against the tunnel, and everything in the book is left and right. Well, you can overcome

that, but you just can't get the lead-in. I tried sitting upside down on the couch, but the only way you can - -

TIME SKIP

15 45 54 ACDR Orange, okay. ... we had all of our snacks.  
CMP Yeah.  
ACDR Okay. ... the left ...  
CMP Yeah, there's a lot left.  
ACDR Oh, okay.  
CMP But I just - you know, if you start to run out -  
ACDR Oh, okay.  
ACDR Okay. ...  
ACDR ... is it mine?  
CMP Yeah.  
15 47 00 ACDR ... 000. ...  
CMP ...  
15 47 15 ACDR 119, 25, 000. ...  
DMP Okay.  
ACDR ...  
CMP Don't worry about it. There it is.  
ACDR ...  
ACDR Starting to ...  
15 48 20 CMP I think your times are wrong.  
ACDR What?

CMP ... an hour from now.  
 ACDR No. There's ...  
 15 49 43 ACDR You know, when I was in the proper attitude ...  
 ACDR Vance, you got -  
 CMP Yeah.  
 15 50 06 ACDR - - Flight Plan is ... keep the same ... suppose to  
 go to ...  
 15 50 58 CMP Tape recorder, FORWARD, COMMAND RESET.  
 ACDR Okay.  
 15 51 30 CMP Okay. NOUN 22.  
 ACDR ...  
 15 51 47 CMP Yeah. ... Okay. I've got ...  
 ACDR Yeah.  
 CMP I think that's ...  
 ACDR ...  
 CMP Now why didn't we ...  
 15 52 14 ACDR Ah, so. Yeah. That's VERB 49 coming up.  
 CMP Yeah.  
 15 53 52 CMP Okay.  
 15 54 14 CMP God damn, we have packed all these things together  
 again.  
 ACDR All of them?  
 CMP ..., Deke.  
 CMP I think the cheese bags are down in the ... I  
 remember - -

ACDR ...

15 55 03 CMP And they used to be on the ... but they didn't have room. ... stuck them down under that jacket.

15 56 31 CMP Okay, 6:10. ... a VERB 49 ENTER. DSE, STOP, REWIND.

15 56 54 ACDR STOP ...

16 14 48 CMP Okay, I can get that. I can get the DMP stuff, ...

16 14 56 ACDR Has it stopped?

CMP Yeah. Going ... to manage.

ACDR Shoot. Thank you. ...

CMP Kind of sorry I ate your other one, now.

ACDR ... (Laughter)

ACDR Son of a bitch. That's the ... everybody had a wonderful ..., right?

CMP There ain't no sense cutting them now.

ACDR No. ...

16 15 47 CMP ... that's straight, Tom.

16 29 18 CMP Roger, Crip. Quito for 5.

ACDR Everything's going smooth on the - program.

CC-H I'm sorry we dropped out there, Tom, and I didn't catch all your comments.

16 29 40 ACDR Okay.

16 30 26 ACDR Okay, Crip. Everything seems to be going real good on the helium glow.

ACDR We'll just keep checking up on the ...

CMP Got to be ... the pantry.

DMP Yeah.

CMP Well, maybe ...  
 16 32 36 CMP Okay, the DSE's stopped, ... RESET.  
 16 32 41 ACDR ... FORWARD?  
 16 42 33 ACDR FORWARD - then COMMAND RESET. Got it?  
 ACDR ... FORWARD.  
 16 43 33 DMP We're still working the helium glow ... ..  
 CMP You know that DSKY work we did this morning? They caught us - I mean, G.D. ... They caught us right in the middle of our bad time, and it'll probably be interesting because I know I said "shit - -  
 ACDR (Laughter)  
 CMP They'll just get some real "voids" from the old command module.  
 ACDR Oh, we're passing Florida[?].  
 DMP ... up ...  
 CMP Deke, could you use any of these yellow pills? I got one batch of them up with To, and I can give - give you this whole batch if you want it.  
 16 45 08 CMP Hey, Tom.  
 ACDR Yeah.  
 16 45 10 CMP Here's a can of pineapple.  
 ACDR That's crushed[?] pineapple.  
 ACDR I don't want this chicken salad. Anybody want that?  
 CMP No thanks.  
 CMP Otherwise I'll just toss it ... I don't like ...  
 CMP Yeah.

16 45 54 ACDR No, I have one ...

16 46 00 CC-H Apollo, Houston. We're about a minute and a half from LOS through Newfoundland. And we won't have you through the ATS until 124:52. At that time, we'll be talking to you about modifying our attitude, so we can put a little Sun on the - the water port, and we will also - I'm sorry, I was telling you a story. We're going to have Madrid in about 5 minutes, INCO corrects me. But we're going to be deleting activating the primary evaporator, and we're going to leave that off the rest of the day if - if your comfort stays okay, and just kind of let that port sublimate out.

ACDR Okay.

DMP ... I can see two airplanes down there.

ACDR Can you?

DMP Yeah.

DMP Contrails.

ACDR Contrails.

DMP Hey, Dick. Where are we right this minute?

CC-H Oh, you're North Atlantic. You're just off the coast of Newfoundland, probably about - almost 1000 miles.

DMP Must be right on the airways. I see a couple of contrails, and I can almost make out one airplane down there ...

16 47 02 CC-H It's probably a pretty good - Yeah, that should be just about the primary route between the States and Europe.

DMP Yes.

16 47 19 CMP Almost see the airplane itself.

DMP Yeah.

16 47 37 CMP Okay, we need DSE STOP and COMMAND RESET.

16 47 40 DMP Okay.

16 59 54 DMP Yeah.

CMP We won't be seeing Russia again, will we?

CMP Yeah; well, because they - well -

17 00 46 CMP Let's see, ... I was going to say - because when we integrate from now on because of the ... cycle.

17 01 47 CMP I can't think of anything that's going off ...

ACDR ... sure we ...

ACDR ...

17 02 49 CMP Should have.

ACDR Vance, what ...

ACDR ... finish this in about - when?

17 03 33 CMP Oh, about 15 minutes.

17 04 04 CMP Okay, Deke, if you want, DSE STOP, COMMAND RESET.

17 10 03 CMP Yeah, he brought in this great big gyro. ... just demonstrate ... but kind of at the last minute thing ... Sure, that is. We'll see how it came out when we get down, later.

DMP ...

CMP On DSE whe - when - I guess he had a camera running too.

ACDR ... situation ... water and everything. ...

17 11 57 ACDR Mine's 25.

17 12 02 ACDR ... is 177.

19 05 44 CMP Okay. ...

ACDR Yeah. ...

CMP Yeah.



ACDR ...

CMP All right.

ACDR ...

CMP Right. What's the matter with that ...?

DMP ...

ACDR Yeah, that's right.

CMP I think you can get a ... - -

ACDR ...

CMP - - brought it out on this much - attitude. I suspect the ... are changing. Didn't hear about ... on this mission.

19 06 54 CMP Waiting for more ... flights, probably.

ACDR ...

CMP Any two or three at various intensities, that's for sure.

DMP ...

ACDR Well, that's possible. ...

CMP Yeah. That is interesting.

ACDR That's my impression.

19 07 44 CMP Lets you know how - what colorband ...

ACDR 3709.

CMP There it is. You're going to be in a good position.

ACDR Yeah.

19 08 53 CMP Now. Boy, that's beautiful.

DMP God damn! Near missed it, too.

MS (Laughter)

CMP Okay. DSE - one time.  
 ACDR ...  
 CMP Okay. ... STOP, ..., COMMAND RESET. Okay.  
 ACDR Yep.  
 19 09 32 CMP It's in the STOP position ... COMMAND RESET is all that's needed to make the switch work. COMMAND RESET.  
 19 26 38 ACDR ...  
 ACDR ...  
 DMP Yeah. That's exactly what happened. Must have been ...  
 ACDR ...  
 19 27 28 CMP I'll tell you, Tom, I find - I think neither one of us should ... second can keep an interest unless we have some participation.  
 ACDR Yeah.  
 CMP If one of us reads, the other one can do the computer work. I still - I think ... it would be better. That way, you have two guys checking.  
 19 27 52 ACDR ... DSE, STOP.  
 CMP Okay.  
 ACDR Okay. ...  
 ACDR Plus ..., plus 210, ... We only got about ...  
 19 29 14 CMP Yeah, and X-ray. I can't think of anything we - we could have done to ... backup.  
 ACDR No.  
 CMP We were mainly collecting urine and all that kind of stuff, and that probably showed up.  
 CMP ...

ACDR ...

CMP ...

ACDR No way.

CMP No?

19 31 45 ACDR ...

CMP STOP. COMMAND RESET. Right?

19 31 59 ACDR FORWARD. HIGH BIT RATE, RECORD. FORWARD ...

19 42 44 CMP That makes me think ... I've got to find one that says this is rev 77 now.

DMP I'll tell you what ... power ...

ACDR ...

DMP Fair enough.

CMP Maybe you can see a sign or something. (Laughter)

CMP Well, I'll tell you. I'm completely - I haven't the slightest idea where we are.

19 43 30 ACDR Hey, you don't think this is over the United States, do you?

CMP I'm beginning to think so.

ACDR Shit, we've been ...

CMP ...

ACDR Huh?

CMP ...

ACDR (Laughter)

CMP ... the States.

ACDR No, it's got to be the States.

DMP It looks more like - -

19 43 46 ACDR There's Chicago, down in the south end I'll bet.

CMP ...

ACDR Hell, yes. And here's Detroit up here and - over here's the - -

CMP ...

ACDR - - the big airport. I'm sorry. I'm not ... right over the ...

MS (Laughter)

CMP I wonder where it was - the things we saw. I can't imagine.

ACDR That had to be ... coming across.

MS ...

19 44 09 CMP That was the lower part of Baja. That's what it was, sure as hell.

ACDR Yeah, here's the great ...

CMP Yeah.

ACDR ...

CMP (Laughter)

ACDR ...

CMP (Laughter)

19 44 49 CMP Sure went across a lot of farmland. That must have been the Midwest.

ACDR Yeah, it was, definitely. ...

CMP I got to associate trees and cheese and stuff like that up there - Germans. (Laughter)

ACDR ...

CMP Yeah.

CMP Well, Tom had me talking ...

MS (Laughter)

DMP You live like it.

CMP Okay ... 42.

ACDR ... 24 ... it says here ...

19 45 34 CC-H Apollo, Houston. We're AOS through Goldstone.  
Should have you for about 7 minutes.

ACDR Goldstone?

DMP Okay.

CMP (Laughter) ...

CC-H Sorry. How about Newfoundland?

ACDR/CMP (Laughter)

DMP That's better.

CMP You had us shook up.

19 45 50 DMP We've just been looking at Wisconsin through our  
spotting scope and across Lake Michigan where the  
clouds ...

CC-H ... then.

CMP Okay.

CC-H Any chance I can talk one of you gents that isn't  
too busy into digging out a pad for me? To improve  
our data a little bit on this upcoming rev 80 for  
EUV, we would really like to run the - one of the  
EUV contingency pads - or the EUV contingency pad  
for rev 80, which is buried down there in Alfa 2.  
Any chance somebody could sneak under the couch  
there and get it?

DMP Just ... We'll get it for you.

19 46 28   ACDR   Well, I can take care of this, Vance.

          DMP   ...

          CMP   Yeah, I can get it. I can get it.

          CC-H   Regarding that furnace, Deke. Don't we have - this kind of sample we've got in there - it's a little bit different from what we've been running, and we suspect it's just outgassing and it's going to take a little while for that pressure to get down. So what we'd like you to do is just to wait awhile on it and go back and check a little bit later and see if the pressure's dropped.

19 46 52   DMP   Okay. We'll do that. And so far as this freezer is concerned, I've had the cover off of that. There is a lot of frost on the plug. But the problem is - in the process of opening that thing, we've accumulated a lot of frost on the remaining samples and the bottom of the plug, and that's where our binding is occurring. ... back in and we're in good shape now. So I propose we don't take the lid out any more often than necessary.

19 47 18   CC-H   Okay. Understand the frost was forming on - -

19 53 37   CMP   Let's see, we got the high gain ...

          ACDR   ...

          CMP   We're not going to have ATS ...

          ACDR   ...

          ACDR   Nope. ...

19 55 31   CC-H   Apollo, Houston. We're AOS, Madrid. We have you for 6 minutes.

          ACDR   Roger. Understand there's no ATS voice until 128:57.

          CC-H   Affirm. In fact, we've even released the satellite such that you couldn't tune it in if you wanted to.

          ACDR   Oh, really.

CC-H Yeah. We figured we wouldn't - wasn't going to need it, so we might as well let them - let them relax.

19 56 01 ACDR Will we have it on and off for the rest of the mission?

CC-H You bet. Just for this one rev that we've released it.

ACDR Oh, okay.

CC-H No, couldn't give up all this good voice and data.

ACDR Right.

CMP Oh, the satellite has other duties too, I understand. It divides its attention between us ...

19 56 46 ACDR DSE, STOP, COMMAND RESET. ...

20 04 08 ACDR Going to have ... 4420, we have ... obs. ...

CMP Yeah. That's what he said.

ACDR ...

CMP Want me to make you a drink or anything?

ACDR Yeah. Make out a strawberry drink or something like that.

CMP Excuse me.

20 07 04 ACDR Okay, Vance, DSE, STOP, COMMAND RESET.

CMP Right now?

ACDR Yeah. I'll hold that. ... I'll hold it. ...

CMP No, I'll get it.

20 07 27 ACDR STOP, COMMAND RESET.

ACDR You got any ...

CMP This kind?

ACDR No, ...

20 15 21 CMP I don't think they work. ... last one ... other ...

ACDR Oh.

CMP ...

ACDR ... I've got some ...

CMP ...

ACDR ...

20 22 55 CMP No, option 2, P20, ... take the VERB 48. The option - the other option ...

20 24 21 CMP Well, it's not the most exciting type of work. Even when we're rushed on it it's pretty easy. ...

ACDR ...

CMP ... Like what?

ACDR Like ...

20 26 17 CMP About - that's 29. ... Okay. ...

20 43 00 CMP You got enough?

20 43 51 ACDR ... as you can see the ... has got to break up. No. It's not lightning. Did you get it all in the other big bag? Get it all in one big bag?

DMP Yeah.

ACDR All stuffed in one bag.

20 44 29 ACDR Well, okay. It's either a 9-day mission or 5 full days or a 10-day ... We got 4 days ...

ACDR Hell, Yeah. Yeah, yeah. We're over halfway. That one bag ... ground it in?

ACDR ...

20 46 43 ACDR Okay. DSE, STOP, COMMAND RESET.



21 02 07 CMP Oh, Deke? Just float it down. ...  
 ACDR ...  
 CMP Do you see any - anything over the North Atlantic?  
 21 03 00 ACDR No. ...

TIME SKIP

22 32 31 CC-H We've actually - If you've been going for as long as you said now on - on exercise, we've got an adequate amount. And we'll just go ahead and take - take the tape recorder and rewind it and set it up for our next pass. And you can do what you like regarding further exercise.  
 ACDR Okay. I'll go ahead for about 4 or 5 more minutes. You want us to rewind it or you want to command it?  
 CC-H We'll go - we'll -  
 DMP ... nothing there.  
 22 33 04 CC-H Rog. You can press on, and we'll go ahead and handle - -

TIME SKIP

23 01 42 CMP Got it. Be over ...  
 23 01 47 ACDR Feels like - more like a ...  
 CMP Yeah. Seems like there's a lot of power ...  
 ACDR ... Oh, I'll get it for you, Deke. ...  
 23 02 03 CMP No. They cautioned us today. Don't forget, when the DSE's on - running ... comm. They're getting it better. I don't know why.  
 ACDR ... one ... Get this bag out. 16. ...  
 ACDR ... put this ... in.

23 03 49 ACDR I don't have it. I've got - I've got some other film but not that one, I don't think. Let me check. I got all the film. Let's see, 5, 9. 3 came out of here. I do have them. The mag here, is 16, 17. I can shoot you one of those. Here's infrared, IF; you can have one of those if you - -

CMP Well, where are we supposed to be now according to their charts. Where should we be on the mags?

23 04 59 ACDR Okay, Deke. Here's 16 - coming at you.

DMP ...

ACDR ... You got a pen?

ACDR Today is ...

23 06 51 ACDR I wonder if some of these things ... put back here.

DMP ... Oh yeah.

ACDR What about these ... that still have about 20 left on them?

DMP Yeah.

ACDR You know, some of these still like ... still have about 30 exposures ...

23 07 37 CMP What is that, mapping?

ACDR Yeah.

CMP What kind is it?

ACDR This one's all out, here.

DMP ...

23 08 23 CMP ... STOP the DSE ... STOP, COMMAND RESET.

23 08 42 CC-H Apollo, Houston. Ascension for 4 minutes.

CMP ...

ACDR ... Yeah, I'm ... having trouble.

ACDR Oh, hell. No wonder. He didn't have his slide[?] up.

DMP ...

ACDR Put the slide[?] up.

23 09 35 CC-H Apollo, Houston. Ascension for about 3-1/2 minutes.

DMP ... reading you Crip [sic].

ACDR Let me try it. I've already got this ...

CMP Yeah.

23 09 43 CC-H And I've got a update to the upcoming P20 for this Earth obs attitude, Deke, if you'd - if you'd like me to update that Flight Plan.

DMP Okay.

CC-H Okay. It's at 131 hours and 15 minutes.

CC-H ... ready to copy?

23 10 10 CC-H Okay. NOUN - there's one change. The NOUN 78, VERB 7 - VERB 25, NOUN 78, I want to change the middle number to read plus 06000. And that'll end up - the three numbers will be plus all balls, plus 06 three balls, plus 18 three balls. Over.

DMP Okay. Copy.

CC-H ... you copied that, due to the data that we see here on the experiment, Vance, from the X-ray, we got a - a change in the pad we want you to do.

ACDR Got it.

CMP Okay. Go ahead.

CC-H Like - Okay. We'd like X-ray H - HIGH VOLTAGE POWER to OFF, now, down on panel 230. And I've got one write-in for you at 29 minutes.

CMP Okay.

23 11 08 CC-H And ... just write in there, "X-RAY HIGH VOLTAGE POWER to number 1 at 29 minutes." The rest of the pad remains exactly as is.

CMP Okay. Part of your "save the wear and tear" program?

23 11 27 CC-H No. Tell you what it is, we don't think we're getting good data on the X-ray. There's a very important target down there at 29 minutes. We're going to turn the HIGH VOLTAGE POWER, OFF now, and turn it back to number 1 at 29 minutes, and the rest of the pad will make it all work. The reason we're not changing any of the interim part of the pad is we're also getting U - EUV data. Over.

CMP Okay. Understand.

ACDR You want to turn your X-ray - -

CC-H Right.

ACDR - - off now?

23 11 52 CMP HIGH VOLTAGE POWER, OFF. Just - just HIGH VOLTAGE POWER, that's all.

23 11 55 ACDR HIGH VOLTAGE POWER, OFF. ...

CMP And at 130 plus 29, we turn it back on again. Okay? No it must be 131.

ACDR ... tape. ...

CMP Yeah. I think we ought to find where we are. And I - I can't - -

23 12 38 CC-H Apollo, Houston. We're about 30 seconds from LOS. Orroral Valley comes up at 131 plus 22. See you there.

CMP Okay. See you there.

ACDR Thank you, Dick.

ACDR Nikon.

ACDR You find it?

23 13 26 CMP It's set up for doing ...

ACDR Okay.

CMP ...

23 13 31 ACDR ... the only thing you got left in here ...

23 14 40 CMP Okay. DSE, STOP, COMMAND RESET. ... on COMMAND RESET.

ACDR Okay. Okay, then ...

CMP Okay.

ACDR ... It's ... on the ... stuff.

CMP Oh, okay.

ACDR ... I think it's going to be okay.

23 16 10 ACDR Where's the - where'd we put that - that quick release stuff?

CMP Pardon?

ACDR Put all that quick release, 16 millimeters ... Nikon down in A-5. And tell them where ... some Hasselblads.

23 16 30 CMP Yeah, there was just two - two Hasa - -

ACDR Hasselblads.

CMP - - two Hasselblads down in A-5 also.

23 16 40 ACDR Two Hasselblads ... Well, we got the ... on them ...

23 17 05 CMP So for Farouk's stuff, compared to ... how many do we have now? ...

# # #

00 29 13 ACDR ... call them on that.

ACDR Houston, Apollo.

CC-H Go ahead, Tom.

ACDR Okay, Dick, down in this - again in this same area - about 32:34 - it says, "Activate primary evaporator." They still want us to leave this one off, ...?

CC-H That's affirmative. Delete that there where it says "Activate primary evaporator." And that's the last one of the day. We're going to leave it off.

ACDR Okay. We're going to leave it off all night, huh?

00 29 39 CC-H That's affirm. We're about - and, Tom, we're about a minute from LOS. Ascension comes up about 10 minutes from now at 132:19. See you there.

ACDR Real good.

ACDR Give Deke a Hasselblad.

CMP There you are.

CC-H And, per the pad, we'll probably get locked up on ATS before we get Ascension.

00 29 59 ACDR Roger.

00 31 44 CMP ... have Ascension?

ACDR 10 minutes.

CMP Well, resolved that one. ...

ACDR ... Oh. Yeah, ...

CMP I think ...

ACDR ...

CMP ...

ACDR Passed the ...

CMP ... you have ... there.

ACDR I got one of it.

CMP I got one after that.

00 32 54 ACDR Good.

00 43 29 ACDR On all those great pictures ... I want to ask, you know, if we can shoot that up.

CMP Yeah, that's - that's one for us.

ACDR Deke, here's your ...

CMP That's true - PAO quick-release numbers, right? That ought to give you ...

ACDR Yeah.

CMP Okay; give me more ... couple of ...

00 44 19 CMP Turn it on ...

ACDR Turn it on?

CMP Ah, yeah.

CMP Okay, and the next one will be VERB 49. ...

00 46 08 ACDR Any idea? I guess it's the fact that ... 50?

DMP Okay. It hasn't been ...

CMP Yeah.

00 47 01 ACDR Fine. I have a big stack of 16 millimeter on Nikons.

CMP Yeah.

ACDR No, in 85, 85. It hasn't ... store that stuff ...

CMP Okay. Here's the next one.

ACDR Yeah, there should be a - See that big stack there apart from PAO? That's the 16 ...

ACDR Almost got to ... every ...

CMP VERB 49 ... 02.

ACDR ... We can kind of shoot it ...

CMP ...

ACDR At 180 miles up ... here and staying ... NOUN here has got to be ...

CMP Okay. ... ENTER. And a VERB ... 49 ENTER ... 117140 plus 075.

ACDR Pardon me ...

DMP Hey, Vance, ...

00 54 16 ACDR Oh, we got the ... on the ... in there ...

CMP ...

00 55 19 ACDR Hello, Houston; Apollo.

00 55 46 CMP All right. MARK.

00 55 51 ACDR Houston, Apollo.

CMP ...

00 56 37 ACDR Houston, Apollo. How do you read?

CC-H Apollo, Houston. We read you loud and clear.

ACDR Okay. Are we locked up on the ATS?

CMP I'm sorry.

00 56 49 ACDR Okay. I'll go ahead there and go to the STOP, REWIND, and ...

00 56 55 CC-H Okay.

TIME SKIP



02 01 24 ACDR ... again.

02 01 57 CDR Okay. UP TELEMETRY ... DIRECT.

ACDR ...

CML Yeah. ...

02 05 08 CMP EUV ... STOP, COMMAND RESET.

ACDR ..., huh?

02 05 15 CMP Yeah. Right now ...

02 10 46 CMP ... plus 34 ...

DMP Plus ...

CMP Plus 17. Plus 317.

MS ...

02 11 12 CMP Yeah?

DMP It's pretty important.

02 11 17 CMP Oh. Well, that's - yeah, sure.

02 11 30 CMP Not yet. ... hit the control. ...

DMP ...

02 11 39 CMP Yeah. We'll wait ... Yeah, we ...

DMP Yeah, let's go. 33 ...

CMP It's ... go ahead.

02 11 56 DMP That's right.

# TIME SKIP

03 07 41 CMP Anyhow, we're going to be just beginning rev 80 -  
... - it'll be about about - 15 minutes. Rev 8 ...

TIME SKIP

11 13 06 CC-H Minus 7 and 323.

ACDR Okay. And we'll check on how our water boiler's doing ...

CC-H Just as we go over the hill, why, everything looks fine. We still have live TV from the Soviet Union - Kazakhstan, where the spacecraft has landed. And we saw it touch down. Cosmonauts got out and everything looks good.

DMP Well, must have been a pretty good landing.

ACDR Vance? Something's wrong. They had the TV live and saw the touchdown. If they had live TV on their touchdown, they must have ... the hell out of their landing.

11 17 38 ACDR We got a 9-minute water dump ... 43:15.

ACDR How's the docking module? Cool up there? How's the ... look?

CMP Not bad.

ACDR Not bad ... For one time, I hope ... Where's the latest? Okay, we got ...

11 18 26 ACDR Deke, while you're there, how about giving the high gain angles? Minus 7 on pitch and 323 in yaw.

ACDR ...

CMP What?

ACDR ...

11 20 52 CMP Go ahead, Deke. Go ahead. Yeah, but ...

CMP Okay. VERB ... CMC Mode. ... Option 5 ... that's 143:04. Okay, option 5 ... Let her rip. ...

ACDR Okay.

11 23 36 CMP You got all of these jet monitors ...?

CMP Oh. ... first chance to dump that thing, huh?

CMP Okay, ... pressed for it. But, hell, ...

11 26 24 CMP Here, I'll take it, Deke.

CMP Okay. Deke, see what you can do.

CMP Find it?

DMP Hey, this is plus 28 ...

CMP Okay, then we can mark that off as okay? Okay.

11 28 20 CMP Next, there's - HRC, CX15 and IF02.

CMP Okay. Tom - oh, yeah. CX15. And it needs another one, then.

CMP Okay. Yeah. All right. IR01 and IR02.

CMP I'm on SERVO. I -

11 29 59 CMP Okay. It was IR01 and IR02, so - Yeah. Oh, wait a minute - U1, U1.

CMP Okay. And I'll check it. ...

CMP 51? ...? I can follow the -

11 31 36 CMP Okay. I don't see any, yet. I think they're in the - Okay.

TIME SKIP

12 29 21 CC-H ... big chute. Coming down, you know, it looks kind of like a diving bell. And just before they hit the ground, there was a big cloud of dust. Must have been when the rocket fired. And then the dust blew away, and they settled down quite - looks like quite nicely. When the people got to them, they got out and stood up, and both of them waved. And so they looked like they were in good health and good spirits.

CMP Sounds great.

CC-H And we're just about going LOS here.

12 30 33 CC-H And, Deke, you get to do your thing with the electrophoresis today?

ACDR I didn't copy that, Deke.

DMP Huh? You didn't. I copied the ending. ... I remember thinking - -

ACDR Right over there.

ACDR Right there.

CMP ... C and D ...

ACDR I got to ...

CMP Yeah, 88. Getting up there, man. Wonder where's ... Mission will be over before you know it. Right. That's hard to tell. That's right. But we got to savor the last 3 days here.

ACDR The light is coming on down to ... Okay. Why don't you - Huh?

CMP ... 10 days?

ACDR Yeah.

CMP Hell, if we start leaving the VTR off now, we might last 12 to 15 days.

ACDR Towel.

12 34 06 CMP B-5, I think, Tom. It's not? I'll look it up in the Supplement and see where it is.

ACDR They were supposed to be in 5.

CMP Why don't I look in the Supplement now while - Deke, you looking for a towel?

ACDR And there's none in here now.

CMP Okay. Let me - let me grab the Supplement ...

DMP You putting the Nikon stuff up in F-1?

ACDR Yep.

CMP All tissues that came were in A-1.

ACDR All tissues?

CMP Yeah. Well, except I don't believe that should be. No. Sorry. Oh, A-2, also.

ACDR A-2, huh?

CMP Yeah.

ACDR Oh, okay.

12 35 04 DMP Yeah. A-2 and D-4. There should be some with the docking module. Only thing is, we'll probably have to ration them. Now, towels. What the hell do they call towels? I guess they are called towels. Here they are. Towels are in A-1, A-2, and D-2. So, you got both in A-1, A-2, and D-2.

ACDR Yeah. Huh?

ACDR ... that's ... towels ...

12 37 56 CMP Take that paper from back of the hand controller.

ACDR Would you take down those towels? ... air conditioner ... water.

ACDR I've got to ...

ACDR ... got it. Battery's dead? ... got a dead battery.

CMP Yeah. Dead battery. You about ready to go? Go down and get ...

ACDR How about ...

CMP How much time you got?

ACDR 12 minutes. ...

12 41 00 CC-H Apollo, Houston through Vanguard for just a little over a minute. Santiago at 144:37.

ACDR Roger, Bo.

CMP Let's see - the batteries are in A-5, aren't they?

ACDR Yeah.

CMP What kind of a thing are they in? I've forgotten.

ACDR ... you did? They're - they're right here. ...

CMP The ... are still with ...

ACDR Yeah.

CMP You're sure they're in A-5, huh?

ACDR ...

CMP Could be A-6.

ACDR Could be A-4.

12 42 08 CMP A-4?

ACDR No, I don't think, but we can check. No, I think A-5.

CMP Batteries, A-5?

ACDR Yeah.

CMP Okay. Book says that, huh?

ACDR Yeah.

12 42 28 CMP Oh, hell, I think the batteries are in A-4, too.

DMP Okay; we're going through ...

DMP It says ... jet engine ... being cut off ...

CMP Deke.

DMP Yeah.

CMP Here's the battery.

DMP Oh, okay.

CMP Hey, maybe we ought to replace 2. Well, I guess we shouldn't replace it.

DMP ...

ACDR Okay. We're upside down going forward. Those valves are to your left. Upside down to your left. If you're right side up, valves are to your right. Upside down, valves are to your left.

12 44 46 ACDR I'm going to need some help on this.

CMP ...

ACDR Got a towel ...?

ACDR Is the Hasselblad ... the Nikon camera bag?

CMP ... that way before. ...

ACDR Right.

DMP What we better do is ...

ACDR I don't think so.

DMP Why?

CMP Because we got a couple of ..., and I don't know about ...

DMP I was going to put another ... back in the rear ...  
back there for ...

ACDR You guys ...

12 47 50 CMP You mean one guy kind of handle things?

ACDR ... like I got a ... See?

CMP Yeah.

ACDR ...

CMP You gotta be quick because it'll make you or break  
you.

ACDR Right. ... Good way to get things done.

CMP There's a lot of wording to ... with regards to  
the ... I mean on the job, of course.

ACDR Got a ..., Deke?

DMP I'll see.

CMP Then what do you need, Tom?

ACDR I'd like to wipe that window better ... And a  
napkin isn't ... I was trying to find that ...

CMP How about a Kleenex?

ACDR ... Kleenex ...

DMP ...

CMP It took me five, and I didn't see any problem there.

ACDR ... I had a pack ...

12 49 27 CMP Yeah, I could use one towel out of that, too.

DMP Okay.

CMP Oh, shit.

ACDR What?



CMP I've got to get a P52. Better hurry up.  
 ACDR Water?  
 DMP Yeah.  
 CMP I wonder how much time I got.  
 ACDR Okay. 27. You got about 5 minutes ... hour ...  
 option 3.  
 ACDR Let me have one ... Got the ...  
 CMP Yeah, they left a ...  
 12 51 13 CMP Oh, okay, Deke. Appreciate it. Thanks.  
 ACDR You ought to take one of those ... they got ... in  
 the LEB ... towels ...  
 ACDR Okay. This is rev 88. Starting the Earth obs at  
 144:30. Sites 8B, C, D, and E ... again?  
 DMP Yeah.  
 CMP Aah, Deke, in a minute, I'm going to need CMC, FREE.  
 Well, maybe I can get it.  
 ACDR I - I'll get it.  
 12 52 06 CMP Can you get it? Not quite yet, but in a minute.  
 ACDR ... in the background?  
 CMP Yeah.  
 DMP Let's see if the ...  
 CMP Okay.  
 ACDR Okay.  
 CMP All balls.  
 DMP Okay.  
 CMP And did you ...?

DMP ...

CMP Okay. Have you got the torquing angles?

DMP 14.8, minus 18.7, minus 12.8.

CMP Okay. I'm going to torque it.

12 53 03 CMP MARK at 144:31:00.

DMP That torque?

CMP Yeah.

DMP ... CMC, AUTO. What were your stars?

CMP 06 and 15.

DMP Sure, huh? ... back up ... Nikon. ...

CMP Okay. Tom, would you leave those free for a second? I'm going to have to get back into a plain old P52. I'm not sure what the Flight Plan says to do. I've ... Okay; I've got to go to 20; that'll do it.

ACDR Okay. I'd better go back to AUTO then.

CMP Not yet - not yet. Just a second. I don't want it to stop in the middle.

CMP Okay. I think we're all right. We'll go 58.

12 54 30 ACDR MODE, FREE.

CMP Okay. Go back to AUTO.

ACDR Okay.

CMP Okay; to 58. ... maneuver.

ACDR Okay.

CMP Got to go down to a pitch 72. Let it - let it fall off.

ACDR Okay ...

CMP Okay. Hold it.

ACDR Vance. Vance, did I ever tell you - -

CMP Okay. So much for the P52.

ACDR Why don't you ...?

CMP ...

ACDR That's what I need to do ...

CMP They got this dune field?

ACDR Here's this dune site at 144:28.

CMP Where - where's the - -

ACDR ... colors.

ACDR Right here ...

12 57 37 DMP You're all set.

ACDR Let's see, ...

DMP ... Check it and see if you see it. ...

ACDR What rev?

CMP What rev? 88. We're just starting 88. We'll have to get the LiOH.

ACDR ... down here.

ACDR ... I'll get it.

12 58 44 ACDR Oh, Vance, flip the HIGH GAIN angle. What they want is a minus 4 and 312. HIGH GAIN angles, minus 4 and 312.

ACDR ... Sure is ...

DMP Yeah, I can. I put it there because ... somebody else.

13 00 16 ACDR Oh, fuck! I wish ... this goddamn machine off.

DMP Do what?

ACDR Fuck the damn ... Sorry that we have to put up with ...

DMP Here's the long river running north to south. It comes up around in here. What direction are we going in?

ACDR There's the river site. Okay. ... 44 and 48.

DMP 44 and 48.

ACDR Yeah.

ACDR No, that isn't ... yet.

13 01 11 DMP 44 and 48 ... Look at that highway down there. All I can see ...

13 04 40 CMP ...

ACDR ... here's one on ...

CMP ...

ACDR ...

CMP No, that is the ...

13 05 40 ACDR Look at that ... down there ...

# TIME SKIP

13 40 45 CMP ... other one.

ACDR 5.

CMP ...

ACDR ...

13 41 21 ACDR 66630[?].

CMP ...

ACDR 66630[?]. ...

13 41 37 CMP ... Hey! There's a hell of a river. Wonder... - -

ACDR I think that's ...

CMP Oh, yeah.

ACDR ...

CMP ... from here.

ACDR Look at those ... ..

CMP Yeah, we're going over ... right now. ...

ACDR ... stop.

CMP ...

CMP Yeah, we're right in through them - ... - -

DMP ...

CMP - - ... said we're going over just the start of it.  
Might not be -

ACDR ...

13 43 26 CMP What's the...? ... Going through ... Hell, we're  
going to go right over China. Look at ..., all those  
...

ACDR ...?

13 44 15 CMP Yeah. ... turn it on.

ACDR Yeah, right.

CMP Yeah.

ACDR ...

CMP I just put it down there.

ACDR Okay. ...

ACDR ...

CMP Think it's ...?

ACDR Yeah. ...

13 44 59 CMP Okay.

CMP Ready for you guys, but I haven't been ... down ...

ACDR Yeah. ...

13 45 24 CMP Okay. Stand by - do it.

CMP Well, it's dark.

ACDR Okay.

CMP Okay?

ACDR ...

CMP ... the whole thing. HIGH BIT RATE, RECORD, ... and -

CMP Ah, man. What a tremendous experience.

ACDR ...

CMP It is now?

CMP Okay.

ACDR Okay.

13 47 21 CMP Ready, start.

13 47 23 ACDR RECORD, HIGH BIT RATE, (sneeze). ...

#### TIME SKIP

14 21 26 CMP Looks like you've got a regular kitchen over there, Deke. You didn't get your breakfast yet?

CMP Let's see. This first one there ...

CMP ... Can I help ...? Do you have ...?

ACDR Okay. ... Can't even touch ...

14 23 05 CMP Okay.

#### TIME SKIP

15 37 52 ACDR Yep.

CMP Ready?

ACDR Right.

15 37 56 CMP Okay. VERB 49 ENTER - VERB 41 - plus 168.30.  
Maybe we ought to do that ...

CMP She ... like a robot.

ACDR Yeah.

CMP 35. Okay. VERB 21 NOUN 46 ENTER.

15 39 19 CC-H Apollo, Houston, talking at you through Orroral.  
Got you for a little over a minute.

CMP Okay. 61102 ENTER. VERB 46 ENTER. Okay, we're  
going to get out ... 49 ENTER VERB 44 ENTER. Plus  
167.40, plus 278.40, 20 seconds.

CMP Roger. Reading you weak, Crip.

CC-H Okay, fine. I've got you loud and clear right now.

CC-H Apollo, Houston. If you read me well enough - Well,  
we're just about to go over the hill right now.  
We'll see you at - at Quito in 30 minutes.

ACDR Okay. Anything you need real fast?

15 40 35 CC-H I was going to give you the DET time to count it to  
on rev 90, which is over on another - the next page  
here of 148:23:01, if you want it.

ACDR 148:23:01. That was 148:23:01, right?

CC-H That's affirmative.

ACDR Got it.

CC-H Okay.

15 40 56 ACDR That's when we start the next one.

ACDR Deke, there's lots of noise down there. Someone must be working.

CMP Oh, yeah? Okay. I want to stand here until you get a dump. ...

ACDR That's correct.

CMP ...

ACDR Ours ...

CMP Should we renew our ...?

ACDR ...

15 42 47 CMP Yeah. Yeah, this little thing here that you hold at arm's length? One way to design it would be so that ... your eyeball ... back here, not back there.

15 43 42 CMP Okay. ENTER VERB 21. NOUN 46. 61101. NOUN 46. VERB 49 ENTER. VERB 49 ENTER. Plus 170.40.

CMP Okay. Stand by -

15 44 40 CMP Go.

ACDR ... ENTER.

CMP Okay. ENTER. VERB 49 ENTER, VERB 21 ENTER. Plus 173.40. ENTER. ...

15 45 29 CMP I'll be able to work in a minute.

15 46 27 CMP ENTER VERB 21 NOUN 46, plus 61102, 46 ENTER. VERB 49, ... plus 17 - plus 178.20, plus 250.00. ...

CMP Hey, would this be known as the ETE camera bracket?



ACDR ... A-6.

CMP Hey, Deke, the ETE camera bracket's in A-6.

DMP ...

CMP Okay.

ACDR Hold on just a minute ...

CMP Okay. We'll be through in a minute and we can help you.

ACDR ...

15 48 42 CMP Beautiful timing here. VERB 21 NOUN 46 ENTER.  
61101. VERB 46 ENTER. Okay. VERB 49 ... plus 181.20.  
33:30 ...

ACDR ...

CMP No.

ACDR I thought you were going to check this one out.  
... Yeah.

15 50 19 CMP ENTER, VERB 49 ... ... you got to wait for this one.

ACDR ...

CMP ..., right?

ACDR ...

CMP ... GD.

ACDR Find it?

CMP Yeah.

ACDR This - this is another ...

15 52 03 CMP Did you find it? Did you find it, Deke? Yeah.

ACDR Did you find it?

DMP Yeah. ...

CMP Okay.

ACDR HIGH BIT RATE.

CMP No. LOW BIT RATE, RECORD, and FORWARD. ...

ACDR ... LOW BIT RATE?

CMP RECORD, FORWARD, COMMAND RESET - COMMAND RESET, I mean.

15 53 34 ACDR LOW BIT RATE, FORWARD, RECORD - COMMAND RESET.

CMP Right.

ACDR Roger. Let's go back to the last one.

CMP ... It kept going until here, and then apparently it just wanted to change LOW BIT RATE. ...

15 54 01 ACDR Powerdown.

ACDR Okay. Next wonderful thing on today's program is to make ... pictures. Remember that your attitude ...

CMP The time is 47:32. Okay, ... 49 ... 25 ... plus 210.90 - -

ACDR Plus 210.

CMP - - 90. Yeah. Plus 060.00, plus 5000. Yeah. That's fine.

15 55 10 CMP Oh, shoot! Did you know that was 060.5?

ACDR No ...

CMP ... first. Okay, you were the first one - -

CMP Plus 210.90 - -

ACDR (Cough)

CMP Okay. Plus 060.50.

ACDR ...

CMP ...

ACDR 210.90, 060.50.

15 55 39 CMP Yeah. Now, I think, activate the PRIMARY EVAPORATOR.  
... this is where we do the ...

TIME SKIP

17 11 11 CMP All right.  
ACDR I just have to really watch that electrophoresis.  
CMP Yeah, I know.  
DMP ...  
ACDR Yeah.  
CMP Yeah. I think we have. Crip said he'd send you  
... shortly.  
DMP Crip, ...  
CMP I guess he's gone.  
ACDR I've still got them.  
DMP ...  
CMP Verify tape going to gray.  
ACDR ...  
17 12 21 CMP VERB - VERB 21 NOUN 46 ENTER. 61101 ENTER.  
VERB 46.  
ACDR Okay. I need ...  
USA ...  
ACDR Yeah. That's what I said. ... What f-stop?  
CMP ...  
ACDR Yeah.  
CMP ...  
ACDR Yeah. I'm running it FAST FORWARD ...

17 14 03 ACDR What's ATS doing besides working with us? Working ...?

CMP Yeah. But I don't know if it is during this 10-day period.

ACDR That's what I was wondering. I just can't think of anyone else ...

CMP Birth control education - Man, if they could do that and help India - it would be worth something.

ACDR That's right.

17 14 36 CMP Okay. ENTER and VERB 49 and VERB 41. Plus 197.30.

CMP ...

ACDR ...

CMP Okay.

17 15 43 CMP You know, if India doesn't get their own population under control - that has signs of being one of the conventional hot spots of 30 years from now.

ACDR Yeah. Look at all this desert we fly over.

CMP Yeah. Right, right.

ACDR That's - there's only so much arable land - and unless you have a way of really taking all that seawater and ... there's just so much the area will support.

CMP Yeah.

ACDR Well, you have to be awful thankful for the climate the way it is in the United States. ...

17 16 33 CMP There's so damn little really good land in the world, it's surprising.

ACDR We've fucked up.

CMP Okay, coming up to 45. And a Jupiter. ENTER 49 VERB 21. 194.30.

CMP ... exercise, a little ashamed ...

ACDR One more ...

CMP Fine. ...

CMP Okay. ENTER. 49 ENTER, VERB 21 ENTER. Okay.  
Plus 191.30. Should turn out 35:20 or 35:25.

17 18 58 ACDR You know one place that's fantastic but hasn't ever  
been touched as far as land ... agriculture ...  
They have great forests.

CMP Yeah. But they're not really too good for agricul-  
ture, are they, Tom?

ACDR Huh? I don't know.

CMP I think the land gets leached.

ACDR The land gets leached, huh?

CMP Yeah.

ACDR ...

17 19 25 CMP That's why they have that policy of slash and burn  
down there. They'll slash out a section of jungle  
and burn it, use it for, as Deke said, 3 or 4 years.  
And then if it's no good, they've got to go slash  
and burn another patch.

ACDR I'll be damned. I didn't know that.

CMP If you put fertilizer on it, it'll wash away after  
the first couple or three weeks.

ACDR ...

CMP Yeah.

17 19 57 CMP See if the other side is better.

ACDR Okay.

ACDR Do I have a one-size ...?

ACDR Yeah, what ...

ACDR Looking at what you've got here. ...

ACDR ... pick up this ...

CMP ... both of them.

17 21 51 CMP Okay. 37 coming up. And we just - all we do is get ENTER and - now. And we get - at 37, LOW BIT RATE, RECORD, FORWARD, COMMAND RESET.

ACDR LOW BIT RATE, RECORD, FORWARD, COMMAND RESET. That right?

17 22 12 CMP Right. And then, in addition, power down EUV.

17 23 08 ACDR Okay, it's set.

CMP Okay.

CMP I wonder what they've done here? CSM ... the book. The bottom ... I don't understand that. ...

ACDR Do you go to the Flight Plan for the rest of it? ...

CMP Okay.

ACDR ...

17 23 45 CMP That's good. ...

ACDR 00000 ... wind up with ...

CMP ... you sure?

ACDR ...

CMP Well, that's good. ...

ACDR ...

CMP Okay. ...

DMP ...

ACDR That's the first set. The timer reads zero.

DMP            Okay.

ACDR           We also have Doppler. ...

17 26 34    CMP           Hey, Deke. We got the tester down in that corner.  
Verify cabin vent QD on - installed.

17 26 56    CMP           Okay. What's this? ... Oh! Okay.

ACDR           ...

17 30 14    CMP           There's the big ... for you, Deke. I bet you've  
got a lot of -

DMP           ...

CMP           Do what?

DMP           ...

17 33 58    ACDR           Hey, Deke.

CMP           Hey, Deke, could you help me?

DMP           ...

CMP           Yeah, I can try to do it, Deke. You got more  
important things to do. What's it - what's it  
supposed to be set up on?

DMP           ...

CMP           Oh, I see.

DMP           ...

CMP           Yeah.

17 35 13    CMP           Now, what are their recommended settings?

DMP           ... settings ... cue card ...

CMP           Oh, the cue card, huh?

DMP           ...

CMP           About - -

DMP           ...

CMP Then you're all set up ...  
 DMP ...  
 17 36 10 CMP Oh, yeah.  
 17 36 49 CMP Yeah. Oh that's great; behind you ...  
 CMP Okay. While Deke is ... that's okay.  
 DMP Right there.  
 CMP Yeah. ...  
 DMP ...  
 17 37 06 CMP No - Yeah.  
 CMP Okay. Well, ... Deke.  
 CMP Oh, yeah. Yeah. Let's see, if we wanted to ...  
 that would be ...  
 CMP Yeah.  
 CMP That would be ...  
 17 38 27 CMP I haven't either, but I have ...  
 17 39 34 CMP Yeah. Sure the hell do. I think that ... Well,  
 after ...  
 DMP ...  
 CMP If you - get a chance, show me where that Adriatic  
 thing is, so that I know ... don't bother. ...  
 help out on that.  
 DMP Okay. ...  
 CMP And I'll be down ...  
 CMP Okay, you can start up there.  
 ACDR That all?  
 17 40 34 CMP Are you ready? ... What part of it ...? ...  
 part.



CMP Okay. I think - Let me try to ... myself better.

17 40 57 CMP Yeah.

ACDR ... Deke.

CMP Okay. I didn't check ...

17 41 57 CMP ... 149:19 ... 149 ... we're ... we're coming ...

DMP ...

DMP Okay.

17 43 17 CMP Okay ... talking about ...

CMP ... almost made it.

DMP ...

CMP Yeah.

17 44 27 CMP ... Right.

ACDR ...

DMP ...

ACDR ...

17 45 59 CMP ... got it stopped, I think ...

DMP ...

CMP 180 degrees.

ACDR ...

CMP ... got ... upside down.

17 46 32 CMP All right. Hit it. ...

17 46 59 DMP Okay.

17 54 59 DMP ... the primary is concerned.  
CMP ... right below you. It's coming in. It may come  
in for you. I don't know. But it'll pitch it over.  
DMP Okay; thanks.  
CMP Yeah.  
17 55 19 DMP ... little problem here. ...

TIME SKIP

18 41 57 CMP ... star 13 ... I just had it there.  
ACDR ...  
CMP Yeah.  
CMP Tom.  
DMP This one?  
CMP Yeah. I just got to wash off this one. ...  
ACDR ...  
DMP Say - they didn't have any ...  
CMP Guess it's cooled off.  
DMP ...  
CMP Well, I don't know. I wrote in, to ... Was this  
the same as - -  
DMP I don't know. That's - -  
ACDR ...  
18 45 18 ACDR Okay. ...

19 00 31 CC-H - second bag, the one that has the eggs in it.  
DMP Yeah. Got it. ...  
CC-H Okay. Have you noticed any - any hatchings yet?  
DMP Well, ... yesterday, but I haven't looked at it today.

19 00 50 CC-H Okay. We're about ready to go over the hill here  
and we'll see you at Goldstone in 15 - 15 minutes.  
And we'd certainly be interested in hearing it when  
you take a look at it - whether we get any.  
DMP All right.

19 02 35 DMP I've got them ...  
DMP Okay. We're in A ...  
DMP Okay. It's probably ... down there ...  
CMP Yeah, that one.  
DMP ...  
ACDR ...  
CMP Right there across from you.  
ACDR ...  
DMP Yeah, that's where it - ...  
ACDR The problem is ...  
CMP ...  
ACDR ...  
ACDR How about this ... here?  
DMP I don't think that ...

19 07 24 ACDR Yeah. I hope you're right ...  
CMP Well, I tell you what ...  
DMP ...

ACDR Is that better?

CMP I'll say this, then I'll ...

ACDR ...

DMP Go ahead.

19 09 18 ACDR Do we have to lock up this -

DMP ...

CMP ...

ACDR That ... instead of popping around.

USA ...

19 11 19 ACDR That was just your ...

CMP ...?

DMP No.

19 14 09 ACDR I'm wondering ...

ACDR ..., Deke, you got all that ...?

ACDR Yeah.

ACDR I didn't hear it. Through here?

19 16 40 CC-H Apollo, Houston. We're AOS through Goldstone. We have you for about 2-1/2 minutes.

ACDR Okay, Crip. And another master alarm came on as far as the light on it ... configure my headset. The whole panel is clear.

19 16 55 CC-H Okay, copy. You got an MC&W -

19 18 42 CC-H - at 150:25, we need you to go ahead and get that in, so we'll be set up for the next helium glow. Also, we'll get you on ATS.

ACDR ...

19 19 08 CC-H Recommend you increase your DAP to 1/2 degree per second for this maneuver.

ACDR 1/2 degree per second, what's the ...? ... DAP by  
1/2 degree.

DMP ...

ACDR About 30 minutes ... go. ...

DMP Okay, Houston. ... make it ... Hold it.

ACDR ...

ACDR Okay. We got ...

ACDR Okay. Now what angles do we have to lock up?

19 20 39 DMP Okay. Minus 35 and ...

ACDR ... We're going across the Midwest.

CMP ... we've gone to far ...

ACDR ... we're on the Midwest ... interstate highway.  
See that interstate highway right down below?

CMP It may even be Oklahoma.

19 21 50 ACDR Yeah, that's Oklahoma City.

CMP I think it is. See that's the lake ...

ACDR ...

CMP It looks like Okalahoma City. I think it is. ...  
(Laughter)

ACDR ... just put it right there, Deke.

DMP ...

ACDR Yeah, that's too bad. Man, that'd be - that'd be ...

DMP ...

ACDR ...

CMP ...

CMP ... that's right.

ACDR ...

CMP Yeah.

19 26 18 ACDR Deke, the high-gain angles for the ATS.

DMP You want them?

ACDR ...

DMP ... 35.

CC-H ...

19 26 28 CC-H Apollo, Houston. We are AOS through Newfoundland. Should get you with the ATS about 51 minutes.

ACDR ...

CC-H Okay. I heard you call back down, but it wasn't very clear. If the comm's not going to be too hot here through Newfoundland, we'll - we'll wait until we get ATS lockup.

CMP Heard you loud and clear ...

CC-H Okay. Reading you the same, now, Vance. One item I would like to go ahead and pick up and get out of the road is for the upcoming helium glow pass; I need to give you the times and a couple of deletions on that. That's rev 92/93 in your Supplement.

CMP Rog.

ACDR ...

CC-H Okay. If you're looking at it, for - we want to set the DET counting up to 151:36:36.

CMP Okay. Helium glow pad ...

CC-H Okay. That's a good readback. We would like to delete X-ray from - from this pad entirely. And we would like to use, on our EUV ops, detector 2, vice detector 1.

CMP ...

CC-H I'm sorry, I said that backwards. We want to use detector 1, vice detector 2.

19 28 22 CMP Okay. ...

#### TIME SKIP

19 58 59 CMP Okay. That's the fast ... do it.

ACDR ...

CMP Okay.

ACDR That's why ...

19 59 38 CMP How we doing on the old Flight Plan? Got the WASTE STOWAGE VENT valve CLOSED?

ACDR Yeah.

19 59 46 CMP ... Experiment Checklist ETE freeze. ..., Deke?

DMP Yeah. ...

CMP Okay.

CMP Furnace, MA ... How about that?

20 00 17 CMP Yeah, okay. Unstow pulser and MA ... samples from A-6. And DM Checklist furnace shutdown. Coming up. Get that? Coming up.

CMP And we're waiting for 6 minutes. That little timer is being used down below, right?

20 00 56 ACDR That timer is somewhere in the spacecraft.

CMP Oh.

ACDR ... I heard it go off. ... right time. ...

20 01 14 CMP Amazing how you can ... zero-g. It was ... DET.

ACDR What was that?

DMP ...?

ACDR No.

CMP No.

20 01 59 CMP That's because we just loaded in the - -

ACDR Oh.

CMP Want it in 4 or 6?

ACDR 6 ... says here. ... can you hand me back the pads? ...

CMP ... we get to the next thing after this ...

20 02 57 ACDR 12.1 ... Start the ... ops. ... about 154:30. Look in the Flight Plan at 154:30. ... got anything else ... He's got his SAM installation and calibration.

20 03 30 CMP Thing is I could probably correct ... will be attitude ... It's going down into 2 minutes.

ACDR Okay. Well, it's got to ... before that. Have to shut it off, close the - you ... on open.

20 03 48 CMP First half of that pad ... over here ... The last part ... the one attitude. ... switch ...

ACDR ... You got a bunch of SAMs coming up ...

DMP ...

20 04 24 ACDR Oh, it's reading about 64 minutes.

DMP 64. ...

ACDR Yup.

ACDR ... came up ...

20 04 47 CMP ... up here so I can check ... Load VERB 25 ENTER, 148.00. STOP, COMMAND RESET.

ACDR Yeah. ...

20 05 10 CMP Yeah.



(Music)

20 09 15 CMP ... Oh, yeah. ... Okay, 49 from this pad ... pad.  
Oh, okay. I'll just put this away and I'll get out ...

ACDR Those are big log books, huh?

DMP Yeah.

20 10 01 ACDR Okay. I'll back you up on it.

CMP When do we pick up Crip? Vanguard?

20 11 25 CC-H Apollo, ... Orroral ... Vanguard. ...

CMP Roger. How long did he say?

ACDR ... minutes.

CMP Okay.

20 12 23 ACDR DSE, STOP ...

20 29 00 CC-H Apollo, Houston. If we could, we'd like to get an  
update on the furnace. According to our Flight  
Plan, it should have been shut down, and we show  
it still powered up. Are we running a little bit  
behind here?

20 29 12 CMP Do you know what the status is?

ACDR Deke's up there working on it now.

CC-H Okay; fine.

20 30 56 ACDR You got some ... the checklist?

CMP Yeah, I guess there's really not much for you to  
do here.

ACDR Why don't you go check on ...?

20 31 13 CMP Hey, Deke?

DMP Yeah.

20 31 15 CMP The ground said they still saw the furnace powered  
up. They just wanted the status.

20 31 24 DMP POWER to OFF.

20 31 59 CMP Deke, and should I tell them you're finished up?

DMP Yeah. ...

CMP Okay. Very good.

20 32 18 CC-H Apollo, Houston. We are 1 minute from LOS. Next station contact will be through Goldstone. That's about 15 minutes away, and it'll be at 152:25. 152:25.

ACDR Okay. Real good. Thank you, Crip.

CMP Hey, Crip. Deke says the furnace is off now, and he's doing prep for MA060.

CC-H Rog. In looking at how we got here, I guess we look like we were just dominoing down from the fact that we had that problem on the ETE with the temperature, and I think everything's just running a few minutes late. We understand it.

ACDR Okay.

DMP ...

CMP No, they just wondered.

CMP What kind of a sample is that?

DMP That's a - -

CMP Oh, yeah.

20 33 18 ACDR ... STOP, COMMAND RESET.

CMP No, you still need - Okay. I thought you didn't - -

ACDR I'm sorry. ... STOP ...

20 33 30 CMP Okay.

20 45 33 CMP Okay. On the camera stuff.

DMP Okay.

20 47 19 CC-H Apollo, Houston. We're AOS Goldstone for 6 minutes.

ACDR Roger. ...

ACDR Okay, Deke. You've got a little more than than 30 minutes. Okay?

DMP What?

20 47 51 ACDR I got you coming up on 30 minutes.

DMP Right.

CMP Did you need the cable? Shall I disconnect the cable here? Good. That'll save room, probably.

20 48 22 ACDR Why don't you stick a piece of tape on each ...  
... and tell them which one was bad.

CMP Okay. I'll put a piece of tape on this saying "bad."

20 49 18 ACDR While you're here, you want to set DSE, STOP, COMMAND RESET?

20 49 24 CMP Okay.

20 59 09 CC-H Apollo, Houston. We're AOS Newfoundland for 7 minutes.

ACDR Roger. I understand we don't have ATS ...

CC-H That's correct.

21 00 06 ACDR Yeah. Yeah. Right.

DMP ...

ACDR Yeah. ...

ACDR Houston, Apollo.

CC-H Apollo, go ahead.

ACDR ... data looking good on us?

21 01 06 CC-H We're looking at you through Newfoundland right now and - which means we're only talking and not looking, VHF only, ... have data. Up until this time, it had been looking good.

ACDR Okay. ...

CC-H Rog. It looks like you're really having fun sitting there punching the DSKY.

ACDR ... new fingertips ...

21 01 26 CC-H Roger that. Take care of all fingerprints.

ACDR Right.

ACDR Vance, ... tell them ...

CMP Yeah.

ACDR This ...

21 02 09 ACDR Hello, Crip, Apollo.

CC-H Go ahead.

ACDR ... if I had a penny for every DSKY stroke, we could have a hell of a splashdown party, couldn't we?

CC-H Well, that's (laughter) that's certainly a good idea. I think we should have one anyhow.

ACDR Oh, we will.

21 02 25 CC-H A little - little side information. After I give this mike here to Dick Truly, I'm going to go over - We're having a little touchdown party for the - for the Soyuz tonight.

ACDR Oh. Real good. Sorry we can't join you.

CC-H Oh, you can have a little orange juice or whatever you got onboard there.

21 02 47 ACDR ...

21 10 47 ACDR ... what the hell was that?

21 10 49 ACDR Something shook ...

21 12 58 CC-H If you want to look at Systems Checklist 1-33, you might run through a C&W check.

ACDR Say again.

CC-H ... Checklist 1-33.

ACDR Roger.

CC-H ... allow you to check it out, if you'd like.

ACDR Systems Checklist 1-33; check for caution and warning ...

DMP ...

21 13 26 ACDR Systems Checklist ...

CMP That's just a standard C&W check, I think.

ACDR We've got to get on the ...

21 13 58 CMP ... Yeah. All that is, is a very short - check. ... let me do it now, cause you're just going ... Crip, I'm going to go through the C&W operational check for you.

21 14 46 ACDR Give me a STOP, COMMAND RESET.

21 26 53 CMP Okay. At 153, ... the TV camera set up for the fish experiment.

ACDR Okay.

CMP Okay.

21 27 18 CMP Okay. Fine. Okay. On the Flight Plan - let's see, this is for fish experiment right? Okay. TV installed at 873, X equals 80. How about Z, first? You want that first? 60.

21 27 48 CMP Yeah. And Y is 170, Z is 60. F, zoom, and focus are - they should be standard: 3.5 - Yeah. When you track, you can tell. Okay? It says here from 606 is where to get that camera. Huh? Yeah. And there there's this TV prep switch list when you get it set up. I'll come on up.

21 28 47 CMP It's DM1. Yeah. DM1, definitely.

21 41 57 ACDR I did. I didn't know. I just ... now for about 40 minutes - about 30 minutes. Yes. Got a little bit of that helium glow, but ...

ACDR Yeah. ... nothing to do. ... look forward to something to ...

CMP I don't know ...

ACDR Okay; ... Okay; ...

CMP Yeah.

ACDR ... get your headset off? ... (Laughter) ... exercise ...

DMP ...

ACDR Just might be ...

CMP ...

ACDR Yeah. ... retrofire. ... in the Flight Plan. ...

ACDR No. Go ahead.

ACDR ... go off ...

CMP Right, Tom?

ACDR No, ...

ACDR Vance, you've got to move your ...

CMP ...

ACDR Yeah.

USA ...

ACDR You ought to ... time. Man, this ... You have it on, Deke?

DMP ...

21 46 51 ACDR Okay. ...

ACDR ... down here. ...

CMP ...

ACDR ...

CMP ...

ACDR Yeah.

21 48 15 ACDR ...

CMP Tom.

ACDR Yeah.

CMP ...

21 50 23 ACDR Yeah, I wanted to turn that to zero.

CMP What for?

ACDR ... zero ...

CMP ...

ACDR Yeah, I wanted ... to take a look ...

CMP ...

21 50 42 CC-H Apollo, Houston. Hello at Orroral Valley on VHF. How do you read?

ACDR Roger, Dick. How do you read? Hello, Houston, Apollo.

CC-H Apollo, Houston. Tom, I read you. Go ahead.

ACDR Okay. Loud and clear. Deke is doing the fish experiment. I'm still working the helium glow scan, rev 92/93.

CC-H Okay. Fine.

ACDR And Vance is working in between on both things.

CC-H Roger.

21 51 17 ACDR We're all set to go to that con - new contingency pad for the X-ray. Then we'll start that - in fact, we'll get busy on that starting about 154:00. One thing, we did check the caution and warning. Everything checks okay. The only thing is that the warning tone in our headset - we can barely hear it when it's turned up, but it's real low - it's dropped considerably compared to when we first - first couple days in the spacecraft when that O<sub>2</sub> warning used to keep us wide awake - you know, all the time. As your warning goes on, the red light goes on. But you can barely hear it. That's the only difference. And we haven't had any more funnies where the light would go on with no other warning. Over.

CC-H Okay; fine, Tom. Let us talk about that just a minute. We'll be back to you. Thanks for letting us know, though.

ACDR Okay.

21 53 46 CC-H Apollo, Houston. We're 1 minute from LOS. Hawaii comes up at 153:48.

ACDR Roger.

CC-H And, Tom, one of the things that we also want to check about the loudness of the tone on the caution and warning is how loud it is with the speaker box turned on, because that's the sleep configuration.

ACDR Okay. We can check that. And we'll have an answer for you by the time you get to Hawaii.

21 55 56 CC-H Okay. Real fine. Thanks.

21 58 26 ACDR Hey, Vance.



CMP Yeah.

ACDR I'm watching the ... here on the caution and warning on the squawk box. See how it goes.

22 02 07 ACDR Hey, Vance?

CMP Yeah.

ACDR ... caution and warning on the squawk box?

CMP Okay.

ACDR I think ... we had a hole in it. ... squawk box?

USA (Loud buzz)

ACDR Oh, shit! Yeah.

CMP ...

ACDR That's pretty loud.

CMP Yeah. ...

ACDR ... go over and get me another one.

22 03 21 ACDR All right. Give me that. That's okay. Oh, ... anyway.

DMP ...

ACDR Yeah. Deke, you put your ... back. ... back.

22 06 04 ACDR Yes.

USA ...

ACDR A what?

USA ... circuit breaker.

ACDR Oh? Well, that solves that.

22 07 08 ACDR Do the circuit breakers ... there?

USA What?

ACDR      Circuit breakers that are in the docking module?

USA      ...

22 07 20    ACDR      Okay; I'll call up Dick. I'm in the docking module.  
                 ...

22 14 06    ACDR      And ... Ain't that ... now?

                 CMP      Yeah.

                 ACDR      ... starting about now. ...

                 ACDR      ... over here from ... Thought you had these two ...  
                 warnings ... Yeah, right over there.

22 15 07    CC-H      Apollo, Houston. One comment on your jet selects.

                 ACDR      Go ahead.

                 CC-H      Well, stand by. Sounds like we may be going in a  
                 keyhole. Hang on a second. Okay, you read me loud  
                 and clear, Tom?

                 ACDR      Loud and clear.

                 CC-H      Okay. You know yesterday we turned off one of the  
                 roll jets, Bravo 2, and turned on Delta 2. That  
                 balance worked well and the quads are more balanced  
                 than they were. The next time you come to a jet  
                 select - It's in the Flight Plan about an hour from  
                 now, and it's printed there and we want you to go  
                 back to the nominal configuration there at 155 plus  
                 07 and then just follow the Flight Plan after that.

                 ACDR      Roger. Nominal jet select on auto RCS at 155:07.

                 CC-H      That's right. And then after that just do what the  
                 Flight Plan tells you whenever you come up on it.

22 16 02    ACDR      Okay, Dick. From 155 on, we do just exactly the way  
                 it's in the Flight Plan.

CC-H      That's affirm. And we're about a minute from LOS  
Hawaii. Newfoundland comes up at 154 plus 10. I'll  
see you then.

22 16 17      ACDR      Roger, Dick.

# # #

DAY 203

00 06 51 CMP Standing by for ENTER ...  
ACDR All right.  
00 07 16 ACDR MARK. ENTER.  
CMP Got it.  
ACDR Next mark 1 minute. ...  
CMP Okay.  
00 07 36 ACDR MARK it. INTERVALOMETER, ON. Okay; that shows 2:30.

TIME SKIP

01 37 26 CMP Okay; 30 seconds to go.  
ACDR Call them off.  
CMP 3, 2, 1 -  
01 37 56 CMP MARK. INTERVALOMETER - INTERVALOMETER, OFF.  
CC-H Okay.  
CMP Steps - step 2 and 3 to get us off.  
01 38 02 ACDR Okay.

TIME SKIP

03 08 43 CMP Do a count. Do a countdown. Countdown: 5, 4 ...  
03 09 25 CMP No. ... later.

TIME SKIP

03 38 17 ACDR 7:20 in the morning?  
CMP Yeah.

ACDR Yeah. What time ...

CMP ...

03 38 54 ACDR Yeah. Well - well, I had a huge bowel movement. The first part was just like it was normal. The last part of it was kind of mushy. That's why it took the whole ...

DMP You've got that big box of wipes.

ACDR I cleaned up. We'll have water when ... gets picked up. Circuit's turned ... batteries. There's water already. We'll do an SPS burn that ...

ACDR Huh?

CMP ...

ACDR Oh, yeah. ... worried about short-circuiting some wires.

03 40 06 CMP Here's the Experiments Checklist.

ACDR It's not on the checklist.

ACDR You want this damn bag back?

USA ...

ACDR That's close enough for the ...

ACDR ... see if we can get your ... here.

03 41 47 ACDR Got the speaker box set up, Vance?

CMP ...

03 41 52 ACDR That got there.

TIME SKIP

04 13 50 ACDR Where is that headblock[?]?

04 18 00 ACDR Yeah.

ACDR Huh?

ACDR Let's get these ... lights out because then -  
because light from those things is fantastic.

ACDR You've got a little bit of ...

DMP ...

04 19 40 ACDR ...

DMP ... It's upside down here.

04 21 44 ACDR Hold it. Hold it. It's got to ...

04 25 08 CMP ...

ACDR 32.

04 26 57 ACDR Okay. If that ...

04 30 50 ACDR 30, 32.

CMP ...

04 33 47 DMP ...?

04 33 53 ACDR Yep.

#### TIME SKIP

12 23 42 ACDR Hey, Vance, for Earth obs, the whole thing is to  
pitch increase on that NOUN 78, hadn't we? 60600 for  
the Earth obs? Yeah, we're supposed to go to that.  
We got 20 minutes to make ... Yeah, the setting's  
on zero. Pitch, 6060 ... Okay; put in another zero.  
The ... is 180 ...

ACDR Got 60604. ... got that.

ACDR ...

12 27 24 CMP Do you have the ... set up, Tom? ...

ACDR Probably.

CMP Okay. If you don't mind, I'd kind of like to change it.

ACDR Yeah. Yeah.

CMP You know, it occurs to me we have that press conference in the morning - whatever morning it is - morning whatever.

ACDR You going to get up and shave?

CMP We're going to have to be up plenty early.

ACDR Yeah. Tomorrow morning.

CMP We'll have to have all the damn cameras set up - -

ACDR/CMP - - the night before.

ACDR Yeah. Okay ...

CMP Yeah.

ACDR ...

CMP ...

12 29 02 ACDR How about going and getting me the high-gain angles ready?

CMP Yeah.

ACDR Minus 4 and 311.

CMP Morning, Deke.

DMP Yeah. (Yawn) Oh, not much. I got an O<sub>2</sub> fuel cell purge ... Just got through the waste water dump, and it's awful hot. It's hotter than hell in there.

CMP Is it? Pardon? What?

DMP ... I'm too tired now. This O<sub>2</sub> fuel cell purge ...

ACDR Vance is down there now. Vance, give me the ... to the urine dump system. Not much to it.

CMP No. Not much. Are there any bags that need dumping?

ACDR I don't think - Wait, yes, there's bags from last night.

CMP Okay.

12 30 16 ACDR I got an Earth obs at 169:40.

ACDR ... got a ... You got a bag?

CMP You want to use Myrtle here, Deke?

DMP ... He hasn't got everything in there yet. ... I think all that stuff got put up there; got that out of your way. ...

DMP Put this down on the ... the electrophoresis.

CMP Okay.

DMP Huh?

12 32 37 ACDR Think in 128. ... You ought to look through that - all that stuff today and see what we got left in here that we can shoot.

CMP Yeah. But - -

ACDR As far as - -

CMP - - we ought to be in good shape on that, shouldn't we?

ACDR No, I'm talking about as far as the DAC.

CMP Oh, yes. Yeah.

ACDR They want to take ... pictures of ... all through that ...

ACDR Okay. I think I may have put - He handed me that - We were in a hurry yesterday, when he handed me that stuff up there. That whole thing. I think that had the other one in it.

CMP In your - in your assessment the other day, did you include DAC film, Deke?



DMP Yeah. Let's see - yeah. Okay. What's coming up next? What would you like, grumpy?

12 33 42 ACDR Deke has to get up and do a helium injection. I've got an Earth obs coming up.

CMP Okay.

ACDR Yeah. Get the ... thing over it.

CMP Okay. I'll go down and get some chow.

ACDR Okay.

CMP Put on a headset.

ACDR Yeah. It's hotter than a son of a bitch.

ACDR Hey, Vance, do you think we have a postsleep period of 1 hour ...?

CMP Yeah.

ACDR Hasn't that postsleep period got a TV camera set up for the press conference in the ... TV pictures? Why the hell do you want TV set up? We can do that the night before.

CMP Yeah. ...

ACDR Right. I'm going to put it in here right now, "Set up TV."

CMP ...

ACDR That's right.

12 35 41 ACDR I'm going to have them wake us up a little bit early to ...

ACDR Well, we have ATS.

DMP We have ATS.

ACDR Wakeup at 7:20, retrofire at ..., and splashdown at 4:20 in the afternoon.

DMP That isn't bad.

ACDR We really - After we get past today, hell, we have ...  
DMP Okay.  
12 36 53 ACDR Let's see what I've got for Earth obs here. 7A, 7D,  
7E.  
12 38 37 DMP Got light again.  
DMP I got a feeling that you ...  
12 39 34 ACDR Yeah, we're not not bad.

TIME SKIP

13 41 06 CMP Yeah. Ready? Am I in your way?  
CMP Yeah. I am. Did you get ...?  
ACDR Yeah.  
CMP Well, I think we've got a lot of time before we ...  
ACDR Yeah, we're ...  
13 42 12 CMP Yeah, you know, we've got a couple of days. That's  
the last big day of the experiment.  
ACDR Yeah, ...  
CMP Got Earth obs? It's daylight outside ...  
ACDR Yeah. I'm trying to find ... Yeah. ... data.  
13 43 19 ACDR How's that battery pack ...?  
CMP I don't know. I haven't really ... But I don't think  
you'll have a problem.  
ACDR How about getting ...  
DMP Gee, I'm up in the DM right now.  
ACDR Oh. Oh, I'll just get it then.  
13 43 38 ACDR Is that right? Well, I wouldn't - I wouldn't dare ...

CMP ...

ACDR Okay.

DMP I'll tell you what. ... supposed to do ...

CMP ...

13 45 25 ACDR Earth obs pass - revs 103-104; sites 7A, D, and F[sic].

13 49 25 CC-H Apollo, Houston. We are about 45 seconds from LOS. Our next station contact will be Quito in about 28 minutes, 169:55. See you there.

ACDR Okay, Crip.

CC-H If you guys get a chance, we'd also like you to CLOSE the POTABLE TANK INLET valve, save a little water for us.

13 49 50 CMP Can do.

CC-H Thank you.

ACDR You ... about the tank. Okay, Deke?

DMP Yeah; okay.

13 51 55 CMP As you look at that ...

ACDR Yeah. Yeah. ... Earth obs?

CMP I don't know. Yeah, if I can.

ACDR Okay. It'll be on the left side. ... left side. ...

CMP ...

ACDR ...

13 55 21 CMP Okay; I'll give it to you later ... Got ATS, I think, coming up a little later. It'll be minus 4 and 311.

CMP Minus 4 and 311.

13 56 37 ACDR I made a fairly close ...

CMP Okay.

ACDR If ... can help.

DMP Is ... power on?

ACDR Power to ...

13 56 56 DMP ... on.

13 58'43 DMP We have a mixture of ...

CMP I'm going put this high capacity urine filter in the loop. We sure don't want that urine vent to plug up.

DMP ...

CMP Huh? Yeah. Yeah, I think I'll just plug it in now.

CMP I don't think that that would give me a vacuum. ...

DMP ...

13 59 56 CMP That's true. But we never think to put it on when we do the special dump, you know? I think I'll just stick it on on this next one.

14 01 06 ACDR I sure wish we would have Earth observations stuff back n ... ..

ACDR Huh?

ACDR Yeah, but - well, yeah, but I mean that - that right now. We have ...

CMP ....

DMP Yeah.

14 03 50 CMP From the beginning, ... take some very unique pictures of everything. Currently, ... be kind of a likely target for then, I would think. Don't you?

ACDR Yeah.

CMP Well, hell! I just found out you can't plug Myrtle and that high capacity filter in at the same time.

ACDR Really? ...

CMP ...

ACDR ... high capacity filter ...

CMP ...

14 04 04 ACDR Oh, yeah. ... has to be ...

CMP Okay. Now. I seem to remember, you said something about battery pack. Get those?

ACDR No.

CMP Okay.

14 05 05 ACDR What locker are those in?

CMP A-4. Yeah, A-4.

ACDR ...

CMP Yeah.

DMP Well, we got the battery ...

ACDR We've got to get ...

CMP Yeah.

ACDR ...

14 05 58 CMP Yeah. Well, not - not a problem. ...

ACDR ...

DMP ... plate.

CMP ...

DMP Pardon me?

ACDR Mix with ... and water.

14 07 54 ACDR Oh, one thing while you got ... help you ...

CMP True. We're ...

ACDR We're ...

ACDR ...

DMP ...

14 09 09 CMP Pardon? Okay. How you doing?

CMP ... kind of worried for a little bit.

ACDR Why, because ...?

CMP I never heard that ... any more. Huh?

ACDR ... need it ...

14 09 41 CMP Yeah. Well, it works okay ...

ACDR Yeah, ...

CMP What? Yeah. Yeah.

CMP I think you've got to be real careful when you've got the high capacity filter. Seems like they ...

ACDR Yeah. ...

CMP ... ..

ACDR ...

ACDR ...

DMP Okay. ...

14 11 42 ACDR To the left.

CMP To the left of 1, right?

ACDR Yeah. To the left of the valve. Just like that.

CMP You're right; left of the valve. ...

ACDR No, it didn't. Didn't have a ... ..

14 12 35 ACDR If you hadn't ...

CMP Yeah. You passed it. ...

ACDR ... just because ...  
 CMP I would put - Yeah, you're ...  
 ACDR ... filter ...  
 14 14 16 ACDR ... we're going to get ...  
 CMP ...  
 DMP ...  
 CMP What are you ...  
 14 15 04 CMP I see land up there, but it's ...  
 14 16 52 ACDR ... back to the ... right through ...

TIME SKIP

14 57 05 ACDR ... there, Vance.  
 14 57 09 CMP Okay.  
 14 58 07 ACDR POWER, ON; POWER, OFF.  
 CMP Yeah. ... Got the ...?  
 ACDR Yeah.  
 CMP All right. ...  
 14 59 33 CMP Okay. We're coming up on X-ray obs, check ...  
 seconds. ...  
 ACDR Is there any modification to the procedures?  
 CMP No. All you have to do is turn the - turn it on,  
 and it's standard X-ray obs. Get it right now.  
 14 59 57 ACDR All right. ... the checklist. X-RAY COVER, OPEN,  
 barberpole. You want HIGH VOLTAGE POWER 2, right?  
 CMP Yeah. That's standard.  
 15 00 15 ACDR All right; it's ON. Mark the time?

CMP Okay. ...  
 ACDR ...  
 CMP Where do we have to go to ...?  
 CMP What all did you have to do?  
 CMP Shoot!  
 CMP We're supposed to be at this attitude. We got a slow maneuver rate.  
 ACDR Maneuver's too slow.  
 CMP What?  
 ACDR Maneuver's too slow.  
 15 01 35 CMP Yeah. We never got there by 3:19. We should have had a faster maneuver rate.  
 ACDR ... faster.  
 CMP ... faster ... our rate. ...  
 CMP You want it now? Stars ... Be sure and make ...  
 ACDR ...  
 CMP Yeah.  
 ACDR ...  
 CMP 334 ...  
 ACDR ...  
 CMP ... Oh, shoot!  
 ACDR ...  
 CMP Okay. We're ready now. 3 - -  
 ACDR ...  
 15 03 17 ACDR POWER, OFF?



CMP Well, I guess we can get that when we get to the last one. Oh, shoot!

ACDR HIGH VOLTAGE POWER is ON, right? Oh, hell ...

ACDR You want us to turn it off - off for 5 minutes?

CMP Yeah. But we're supposed to be in an attitude. We're not going to have ... You might as well turn it off, I guess.

ACDR Well, I got to purge this.

CMP Yeah. Okay.

15 04 29 CMP Okay; let's see. The next point we can pick up at - is 8:47.

ACDR Do you want the covers closed or just the doors closed?

15 04 56 CMP Oh, no. Just POWER, OFF. Oh, hey, turn - close the - -

ACDR All of them?

CMP - - doors. Yeah.

CMP Turn the whole thing off.

15 05 13 ACDR I'll leave the LOW VOLTAGE POWER, ON.

CMP Okay. ... going down now ...

15 06 08 CMP Okay. That's the first attitude. ...

ACDR Got the ...

CMP ... coming up that way.

ACDR They want the doors left open for this.

CMP Hey, what we do is ...

ACDR ...

CMP Well, that's right. Okay.

ACDR I'll turn it back on as you - Tell me when you're there?

CMP Okay. You can turn it back on. ... for 14 minutes.

15 06 53 ACDR Power's coming back on.

15 07 37 CMP Okay. I'm sure hoping we can make that. Why don't you make it HIGH VOLTAGE POWER 2.

ACDR 2?

CMP Yeah.

15 08 11 CMP Okay. We've got her up and ...

ACDR Okay. Did you get the ... on the tape ...? Have you got that done?

CMP Yeah. I got that done. I'm just trying ...

ACDR I think something popped out of here. Okay. Your new film ... just popped out. Just popped out.

15 10 10 CMP Turn HIGH VOLTAGE POWER, OFF. ...

CMP 6 seconds.

15 11 13 ACDR Off?

CMP Yeah.

15 11 15 ACDR It's OFF.

DMP How long does it take to punch this?

ACDR Punch, you fucking thing! We got such a God damn screwup!

ACDR It's powerdown, and just off and on. Turn it on again?

CMP Well, you know, you have the - What you did was you powered down, ... and then you powered up again.

ACDR Yep. It says power ... for X-ray obs ... You want the HIGH VOLTAGE POWER, OFF?

CMP Yeah.

ACDR But that's not - but I powered down.

CMP And then you powered up again.

ACDR Yeah, I know.

15 12 05 CMP Okay. ... HIGH POWER - HIGH VOLTAGE POWER to 2, just now ON. But to do the powerdown, the purge ...

CMP ... 20:03.

15 14 12 CMP Do that next. The purge ...

CMP Okay.

15 15 42 ACDR ...

15 17 15 CMP ... VERB 49 ENTER. Okay; plus ...

ACDR ... huh?

15 18 05 CMP Yes.

CMP I crossed it out surer than heck.

15 18 56 CC-H Apollo, Houston. We're AOS VHF only through Orroral, currently. I got you for a couple of minutes.

CMP Okay.

ACDR Crip, we can barely read you.

15 19 54 ACDR We were holding when he started ... I had that attitude ...

CMP ... Give it to them ...

ACDR Do you want to take the ...?

CMP Okay.

ACDR Huh? Let me know when.

CMP Okay.

ACDR Ready?

CMP Ready -

15 20 35 CMP MARK it.

ACDR ... I'm watching it.

15 20 52 CC-H Apollo, Houston. About 30 seconds left here at  
Orroral. Next station contact at Quito at 171:28 -  
171:28.

CMP Okay, Crip.

CC-H That's about 30 minutes from now.

CMP Okay. Just for your info, we had maneuvering problem  
and lost the data from after 2 minutes up to 8:47  
on. How do you read, Crip?

ACDR ...

15 21 51 CMP Got it.

ACDR So if I can't drive this, I'm going ...

CMP Yeah. The question is, should we go the full 5  
minutes or should we cut it off at 26:20?

ACDR It's still maintained.

CMP Yeah, I know, but the question is ... drifted out of  
attitude.

ACDR I know it. Well, we don't have this ...

CMP I guess if you've got to stop someplace ...

ACDR Right.

CMP Someplace that ... tape recorders, a lot of ...  
Get an off nominal ... do a data take later downstream.

ACDR Yeah. ...

CMP Okay. Which - Have we started - -

15 23 02 ACDR Okay. You've got 2 minutes to go again. 26 to 28;  
assuming right after 28, it's right about 29. So,  
we've got 2-1/2 minutes to get to the attitude..  
We'll get that real fast and ...

CMP Yeah.  
 ACDR ... call again. ... this target ... Okay. ...  
 start again new. ... to go back and forth.  
 15 24 30 ACDR Go.  
 CMP Okay.  
 ACDR Then, we've got - -  
 CMP Okay.  
 ACDR - - 4 minutes to get things started.  
 CMP ...?  
 ACDR Yeah. Next start at 24 - -  
 CMP ...  
 ACDR - - 24:29 - I mean, 24:25. ... Power down.  
 15 25 17 CMP That's right. You should power down. The first  
 thing is at 29. Then we want to STOP, REWIND, and  
 COMMAND RESET.  
 ACDR STOP, REWIND - -  
 CMP Yeah. At ... STOP, REWIND, and COMMAND RESET.  
 ACDR Go.  
 15 25 38 CMP MARK it.

#### TIME SKIP

18 01 48 ACDR All right. Change the ... temperature.  
 ACDR Oh, it's minus. ...  
 CMP Hey, Tom.  
 ACDR Yeah.

CMP Would you turn the HIGH VOLTAGE POWER, OFF, for a second? Oh, I'll get it.  
 18 02 20 ACDR HIGH VOLTAGE POWER, OFF.  
 CMP Good. And we'll turn it back on now in about 2-1/2 minutes.  
 ACDR Check.  
 CMP Okay.  
 DMP Huh? ... What? That looks like a ...  
 ACDR Yeah.  
 CMP ... it's 44.  
 ACDR Yeah.  
 DMP 30. ... on. 30 degrees. ...  
 ACDR I don't know.  
 DMP ...  
 18 03 19 ACDR Yeah.  
 DMP Okay.  
 CMP ...  
 ACDR Yeah.  
 ACDR ... flash attachment?  
 CMP No.  
 ACDR Where's mine?  
 18 04 11 ACDR Where's your flash attachment?  
 CMP Going to have to ask him, I guess.  
 ACDR Deke.  
 DMP What?

ACDR Where did you put the flash attachment for the Hasselblad? Yeah. Which one? By your seat?

CMP Okay; I got HIGH VOLTAGE POWER, and ... starting to go down straight.

ACDR That's automatic then?

CMP Yeah. ...

CMP ...

ACDR ...

18 06 14 CMP Okay. There's a super big raster. Yeah. ... Okay. ... for you too, okay?

ACDR Okay.

CMP ... Good. Okay; which way should I get? This way? Okay; brighten it.

CMP That thing's ...

ACDR Except one of ... Yeah. ... Hasselblad.

18 08 06 CMP I've got HIGH VOLTAGE POWER 2 to OFF now.

ACDR All right.

CMP ...

ACDR OFF, barberpole.

CMP Okay.

ACDR You got that picture? You mustn't miss it.

18 08 59 ACDR Okay. I just ...

ACDR Let me know if you need anything, Vance.

18 11 34 CMP Okay, Tom. Not just now. I think it's working pretty good.

18 16 06 ACDR Good. She checks out well. Huh?

18 17 24 DMP Got a Flight Plan down there?

ACDR Yeah.

DMP Okay.

ACDR ... Right here, Deke. MA044. Yeah. Got the furnace shutdown, the furnace prep. Furnace prep. MA044.

CMP Need the HIGH VOLTAGE POWER 2, OFF, down there.

18 18 05 ACDR It's OFF.

CMP Okay.

ACDR You counting those ...

18 18 59 CMP Yeah. Real weird. Could've done a raster - or rather, fast raster going along ...

18 35 03 CC-H \*\*\* on the ETE?

ACDR Yeah; okay. We went back, and we're checking - -

18 39 36 CC-H Okay. Going over the hill. See you at Goldstone in 16 minutes.

DMP Okay. ...

18 39 44 ACDR Okay. INTERVALOMETER, ON. ETE MODE SELECT, see table 1. Electro.

DMP ...

ACDR ...

CMP ... the Earth Obs Book ...

ACDR I'll tell you what, I'll try to ...

DMP ...

ACDR ...

DMP ...

ACDR Okay. I'll ...

18 41 38 ACDR Say, we can call down and ask about the DAC ... be on that ... I think it's in the Photo Ops ... All right. ...



ACDR That's what I thought. ...

CMP I'll be ... I won't be in the window when you ...

ACDR Yeah, ...

18 43 55 ACDR You going over ... take that DAC ...

18 46 15 ACDR Okay; I'm going to ... put the DAC on.

DMP ...

ACDR ...

18 48 39 ACDR Okay. It's 174:26. ...

ACDR ... right before the ...

18 50 35 ACDR I'll take that tape ... Hell, they ...

CMP Yeah.

ACDR ...

CMP Right.

ACDR ...?

CMP Yeah. I just saw a ...

18 52 04 ACDR Well, hell, if they were any ... nobody ...

CMP Well, ...

ACDR Let's see ...

CMP ... I'm not sure ...

ACDR ...

CMP ... Okay. Let's get ... Got a ...

ACDR That's about right, I guess.

18 55 43 CMP Yeah. ... I don't know.

18 56 06 CC-H Apollo, Houston. We're AOS through Goldstone. We have you for about 3 minutes.

ACDR Roger. And we're right over the Rio Grande River now. Yeah, I wish the girls could see this site up here that we're seeing, Crip.

18 58 15 CC-H Yeah. Right now we got the TV playing for them of Vance doing those science demo things over in Soyuz.

ACDR We're right over El Paso. You can look down and see Dick's Air Force Base and the International Airport.

CC-H Roger.

ACDR ...

CMP Guadalajara ...

ACDR ...

19 00 00 ACDR Okay, Crip. We're - looks like we're ...

19 01 31 CMP We're ... Earth attitude ... attitude ...

ACDR ...

CMP ...

19 06 13 CC-H Apollo, Houston. We are AOS through Newfoundland. And with the ATS, we should have you about 50 minutes.

ACDR Roger.

CC-H Okay. And we got it rigged up where the girls are listening to you again. Incidentally, if - to help this problem we've been having with some of our interference, one of the things that - about the only thing we can come up with doing on VHF is to go ahead and select SIMPLEX Alfa now, instead of staying in Bravo, and that'll change the freq and might - might get rid of some of it.

CC-H That's affirm, Deke, if you would, please. You can go ahead and go Alfa, and Bravo off.

19 07 08 CC-H Rog. Was it pretty clear?

CMP Unfortunately, it was covered with clouds over Sudbury nickel and certain sights that I was to get. But it is very impressive. No doubt about that.

CC-H Incidentally, Vance, while I've got you there, that last pass we had you guys run - end - ended up leaving you in 1/2 degree for your rate on your DAP. And you can go back and change that to 0.2 whenever you'd like.

19 07 48 CMP Incidentally, we did get to see the Adriatic. Got quite a few pictures of the lower half of Italy, from the boot up to - oh, I think it's - oh, I'd say about halfway up. But it - it was a cloud cover over Venice.

CC-H Copy that. Thank you very much.

ACDR Hey, Crip, tell the girls I wish they could ...

19 09 25 ACDR ... See there, right there?

CMP ...

ACDR That looks like it came from a ...

CMP Oh, that little spot?

ACDR Yeah. That white thing.

CMP It looks sort of like ...

ACDR Yeah. Look at the - look at the trailing wake behind it.

CMP ...

19 10 05 ACDR Hey, Crip, we just had a big iceberg out here in the North Atlantic, and it had a trailing wake behind it.

CC-H Copied. A large iceberg with a - a trailing wake, is that correct?

ACDR You see, it's like a, you know, like a - a bow wave on it.

CC-H Rog. Tom, we ended up dropping out there on VHF when we were trying to switch over and get ATS. And I'm back with you now on VHF. Don't think we got ATS voice locked up good yet. But I think you were just about to make a comment to the girls, and I don't believe they heard it.

19 10 34 ACDR I said I wish they could enjoy this view we're having up here today, looking down at the Earth.

CC-H Rog. I imagine that's quite a sight.

CMP ... Chicago a couple times ...

CC-H Very good. Bring them back, and we'll all be able to have a chance to take a - take a look at that beautiful view you guys got.

ACDR ...

CMP ...

ACDR Yeah. ... bow wave ...

CMP ...

ACDR ...

19 11 44 CC-H Incidentally, the Flight Plan calls for me to give you an update to the mapping pass you got on mapping pass number 10 - you've got on the next - next rev. And that time is nominal. We do not need to change that. Any time that it might be convenient for you guys, I have a rev 138 block data pad that we can go ahead and update to you.

ACDR Rev 138 block data pad.

CC-H ... need to - need the Updates Book. But need to make sure I'm locked up good on the ATS before I give that to you. And apparently we're not yet.

CMP Okay. Before we go into that, Crip, we haven't seen ... been very hard to see the Antarctic area due to cloud cover. ... stray icebergs down there. ... first iceberg we've seen. Might just mention that, up here in the north, it was traveling through a - looked like a fog layer - and leaving a wake. ... stationary, ... No evidence of rotation, which is one of the questions they've asked about icebergs in general.

CC-H Okay. Sure that Farouk will be happy to get that data.

ACDR Okay. I got the echo again.  
19 13 12 ACDR Updates Book.

TIME SKIP

20 27 39 CMP There yet?  
ACDR Yeah. Here's the California coast. There's San Francisco, the Golden Gate, ...  
CMP Very good.  
ACDR Yep. ... Nice ...  
20 28 19 CMP And the color I can get from the Pacific Ocean is 47-B just offshore from San Francisco. No evidence of current boundaries yet. Little bit of cloud cover up to 2 miles offshore.  
CMP Okay. Yeah - I'm tracking it.  
CC-H \*\*\* after you finish your mapping pass. Also, if Deke can, I'd like to get an estimate as to whether he wants to try to go ahead and get that OBS exercise in early, or is he going to go ahead as called out in the Flight Plan?  
CMP Oh, well, we got the photos. He'll get the end of it anyway.  
20 30 34 CMP Okay; the Bingham copper mine - looks to me like there's definitely an area of gray over there, or has a grayish cast. Now it could have been a false fault. Now that - Part of the - All I can say is the area around the Bingham copper mine was once quite pronounced and very gray.  
ACDR ...  
CMP Okay.  
20 31 10 CMP Well, - -

TIME SKIP

21 29 18 CMP You heard Crip say that ...

21 31 13 DMP Yeah. I wonder ...

CMP Been 5 minutes since they've gone over the hill. Let's see, next pass is at ...

CMP ... vis obs ...

ACDR Have you got the Earth Obs Book?

CMP Yeah.

21 32 02 CC-H Apollo, Houston. We're AOS through Orroral for 3-1/2 minutes.

DMP Okay.

CC-H Hey, Deke, all the - our medic folks would - really appreciated that - all the efforts you went through to get that data. It all came out nice and clean here. It looked real good.

CC-H Yes, sir. Everything was super.

21 32 32 CC-H Okay; fine.

CC-H \*\*\* line entries but not nearly as long as some of the ones we've already made. If somebody is available at Hawaii, which comes up in about 15 minutes, I would certainly appreciate being able to read the modifications to you there. Incidentally, your recovery ship is also going to be active on - on your - VHF, and you might be hearing them when you come across there this time.

21 34 45 CMP Okay; real good. ... And we'll go ahead and maneuver, okay?

CC-H Okay; fine. Press on. And the PI'd really appreciate it. He's pretty excited about this new target.

CMP Okay. ...

ACDR ... huh?

21 37 36 CMP Yeah. Power's off. I powered down. ...?

ACDR Yeah. ... yet.

CMP ...

ACDR Oh. ...

DMP ...?

21 41 11 CMP Yeah. Yeah, you drew in. ...

ACDR ...

CMP Yeah.

CMP ... I've never noticed ...

ACDR ... 30 minutes?

21 43 30 ACDR 35 minutes.

DMP Well, let's see here. Got the DAC.

21 43 50 ACDR ... We have the - the light flash setup after this  
... The light flash is stowed up there with the ...

21 55 27 CC-H Okay. We're about 1 minute from LOS Hawaii. That  
was kind of a busy first pass. We'll be seeing you  
coming up here at Bermuda in about another 15 minutes,  
and I'll call you there.

ACDR All right. And real good. Are the ATS angles the  
same, ... to lock on, the book was wrong. Over.

21 55 53 CC-H Stand by just a second. Tom, these ATS angles are  
correct.

ACDR Real good. Thank you.

CC-H Okay. See you later.

21 56 07 ACDR Say. One thing. Is the nominal time counting up  
at 177:58:36? Over.

CC-H That's affirmative. It was less than 1 second off,  
Tom, and we've decided not to change it.

ACDR Real good. Thank you.

21 56 15 CC-H See you later.

TIME SKIP

22 52 25 CC-H And this was the - the last of the - complicated experiment pads, and I don't see how it could have gone more perfectly. Looks like a real good show.

ACDR Ah, thank you very much. We'll also thank you guys on the ground, because you really helped to pull us through here on an occasional mistake on a DSKY punch or something else. It was all very efficient. Thank you.

22 52 49 CC-H Well, I was looking hard to catch a mistake that time, but I sure didn't see one. Also like to pass - -

22 57 00 CC-H \*\*\* that last maneuver, Tom, I'd like to talk to you a bit about the ... on the secondary evaporator.

ACDR Go ahead, Dick.

22 57 11 CC-H Okay. It turns out that we've got a choice, Tom, and we've done a ... in the last 10 minutes. If you activate the secondary evaporator, which is in the Flight Plan coming up here right after this pass at 178 plus 50, and can leave it on just about all the way to bedtime and then - -

23 01 15 CC-H Apollo, Houston. We're coming up on 2 minutes to ATS LOS. Bermuda comes up at 179:21.

ACDR Roger, Dick. Glad it went real good for them.

CC-H Boy, that was super, Tom. I assume Vance and Deke didn't go EVA or something. I haven't talked to anybody but you since I got here. They didn't abandon ship, did they?

ACDR No. What we're doing is trying to get ahead of it, and we're already setting up the light flash experiment. Those two been working on it full time.

CC-H Roger. Sounds good.



CMP It's Tom's day to talk.  
CC-H Okay.  
CC-H Well, we'll see you at Bermuda.  
23 01 57 ACDR Okay.  
ACDR Okay. In about 40 seconds, I've got a couple of switches over there.  
CMP All right.  
ACDR I'll call them out to you.  
ACDR Okay. I want - DSE, LOW BIT RATE, COMMAND RESET.  
23 02 45 CMP DSE, LOW BIT RATE, COMMAND RESET.  
23 02 49 ACDR EUV on the helium glow powerdown.

TIME SKIP

23 52 32 DMP Where's ...?  
CMP It's on the ... here, Deke.  
23 52 37 DMP Okay.

# # #

DAY 204

00 04 08 CMP Okay. Tell me when you ... program ... ..

00 04 44 CC-H Okay, Deke. And we're about 30 seconds to LOS.  
Guam comes up about 40 minutes from now, at 181 - 180  
plus 21, in case we don't get these readups in.

DMP Okay. We're standing by - 183.

CC-H Okay. Down in the DP column at 183 plus 20, I want  
you to delete "X-ray" from that ops there. And down  
below that, also delete - "Remove the cabin vent QD  
and stow it." We're going to need it tomorrow. We  
are going to do another purge, and we'll be seeing  
you on the ATS.

CMP Okay. You say you will not do a purge tomorrow?  
Purging today, right?

CC-H We - we are going to do it tonight, but we do not  
want you to remove that vent QD and stow it. We  
want you to keep it out because we're going to use  
it tomorrow.

CMP Okay. Understand.

CC-H And, also, delete the X-ray ops.

CMP Got it.

CC-H And, we'll see you when we get locked up on the ATS.

00 05 48 CMP Okay.

00 06 03 DMP I got ZFF photos, Tom.

DMP Say, I got the bag ... delete ... the purge tank set.

DMP You got some place you're putting partial bags  
and ...?

ACDR Not me. Vance ...

DMP Okay.

ACDR ...

DMP            Okay. Well, here's one that's got about 3 degrees  
                  ... management ... what we had. But by the time we  
                  do that we've already done it anyway.

00 07 31    CMP            Hey, where are you headed, Deke? Right - right there?

DMP            ... down there.

DMP            You about ready to pitch 2?

CMP            ...

DMP            Okay.

00 13 30    CMP            38 minutes.

DMP            ... The Flight Plan ...

CMP            ...

DMP            Vance was fooling around ...

CMP            I thought we were ... bag ...

DMP            ... whole bag is gone for ...

DMP            ...

CMP            I think it's this one.

DMP            ...

CMP            I don't know.

DMP            ... after ...

DMP            So, ...

ACDR           Well, I don't know, think ...

00 16 55    CMP            I guess we're going to have to fake it. I know  
                  what happen, I bet you. ...

ACDR           ...

CMP            ... try another bag if it's ...

DMP Yeah. ... Okay; CMC, FREE.

DMP Yeah. I've been going to ... those batteries.

CMP Yeah. We better watch that too. ...

CMP ...

DMP Okay. ...

CMP Well, let's see ...

CMP What happen, Tom? ...

ACDR ...

00 19 55 CMP Yeah, I'll be ... You already ... Well, the ...  
Now, probably ... through. It's all right. ...  
we're already there. ... POWER, ON; POWER, ...  
running ...

ACDR Yeah.

00 20 40 CMP ... Yeah. ...

#### TIME SKIP

01 21 30 DMP How about that?

CMP Okay. I saw long streaks over in the right corner.

DMP ...

CMP Not very exciting for you, I don't think ... not very  
exciting for you right now.

DMP No. ...

ACDR ...

01 23 20 CMP ...

01 24 20 ACDR Yeah. That's why I stay ...

01 28 14 CMP ... my eyes are watering.

01 29 38 CMP How long before we ...?

01 35 25 ACDR I've got a long streak ...

DMP ...

01 36 27 CMP Okay.

DMP ...

01 38 34 ACDR ... saw a star in the ...

01 40 09 CMP Very right ... upper right ...

01 42 22 CMP Okay; I got a star, ... Star ...

01 44 19 ACDR I see a long streak, upper right ...

DMP ...

ACDR ...

01 45 28 CMP I sure am ...

CMP Okay.

CMP ... There's a star ...

CMP Star, left side. ...

01 47 45 ACDR Star ... left side, ... I don't know, it's prob-  
ably ...

01 48 33 ACDR Star, I'm sure ...

01 48 45 CMP Star. Well, that's to the left.

ACDR ... right side to left side, I'm sure ...

01 49 46 CMP Star ...

CMP 3, 2 ...

01 50 58 DMP I'm going to follow the ... here ...

DMP ... That's enough.

01 52 11 CMP Okay. Streak, right side to left side.

ACDR I saw a star ...

CMP ... right side to left side.

01 52 39 ACDR ... right ... right ... It's real strange.

01 54 47 CMP Okay. Streak, upper right ... Saw a bright star, upper left ...

01 56 50 CMP ... I saw a real strange thing. ...

01 58 35 ACDR ... star ... left ... Short streak ...

CMP ... star ... lower left ...

01 59 41 CMP ... right.

ACDR Right ...

CMP ... right of the right eye. ...

02 01 26 DMP Okay. On the very ...

CMP Saw a star ...

02 03 12 ACDR ... star ... right eye.

CMP ...

02 03 34 ACDR Yeah. Yeah.

02 18 41 ACDR Yeah.

02 18 47 CMP ... Deke. Yeah, ...

02 28 18 CMP That's a ...

CMP Okay. I got a long streak.

ACDR In this kind of thing, you know, when the lights are bad, the short streaks - the short streaks ...

DMP My angle is right eyeball.

CMP Okay. Got a star, right eye, center.

02 29 53 CMP Okay; a long streak ... of my right eye, and it was vertically orientated.

02 31 50 CMP Seem to be having flurries quite often.

ACDR Yeah, ...

02 32 28 ACDR Okay. Got a very bright star in the lower right quadrant of the left eye.

DMP ...

02 33 42 CMP Okay. Got a diagonal long streak. I think it was a - either a long streak or ... streaks in the left eye, center.

02 52 19 ACDR Okay. I've got ...

CMP ...

02 53 15 DMP Do it now.

02 53 27 ACDR Okay; now. The pitch ... centered.

# TIME SKIP

03 55 33 ACDR Okay. ... - everybody make a ... Who's got the ...?

CMP ...

ACDR DM Checklist, helium injection, page ...5. Yeah. MA044[?] ... .. verify. ... light on.

CMP Okay. Right.

ACDR Wonder if that's verified?

CMP ...

ACDR Yeah. Verified on ... I'll get the ... All you got to do is ... I'll - I'll get the ...

03 57 23 CMP Yeah. Where did the fucking procedure go?

ACDR You say it's different?

CMP ... get the procedure out, take the apron off, and open the doors, and get the canister out ...

CMP Huh?

CMP Yeah. ...

CMP Huh?

03 59 00 CMP ..., please. I'll get rid of the other stuff.

CMP I'll - I'll still give that a hack down here. I'll still give that a hack, I guess. Oh, okay.

03 59 28 CMP Thank you.

04 03 55 CMP Deke, would you hold that thing? Oh. Damned thing disappeared. Well, fine. (Laughter)

CMP Yeah.

04 04 10 CMP Well, ... on the - on the screen ... I don't know. Oh, yeah. ... interior.

04 05 54 CMP ... ... we haven't got.

04 06 46 CMP I said ... the valve. Guess that's about it. The water's good.

CMP May be cool enough to ... with the fan on tonight.

DMP There you go.

CMP Say again, Tom.

04 07 25 CMP Go ahead. I'm going to go with you.

DMP ...

04 08 07 CMP I'm going to turn on the speaker box here while we're working. Then if anybody calls, get it that way.

04 16 19 CC-H - - morning. We'll wake you up early, and we do not see that the SIM bays are activated yet. Just be sure and don't forget to activate them and use detector 1 on the EUV.

04 16 31 CMP Okay. Understand. We're still venting.



04 16 35 CC-H Okay. Understand. So we'll see y'all in the morning.  
04 16 37 CMP Good night.

TIME SKIP

10 49 18 ACDR Good morning, Bo. How are you?  
ACDR ...  
ACDR All right. Real good. Thank you, Bo.  
10 50 08 ACDR Houston, Apollo. Houston, Apollo.  
11 02 55 CC-H Apollo, Houston through Ascension for about a minute  
and a half.

TIME SKIP

13 18 55 ACDR Yeah, that ...  
CMP Okay; let's go ...  
USA (Music)  
13 25 45 ACDR That's my favorite music. ... What?  
13 28 33 DMP Granolies.  
CC-H Granolies! Very good. We're about a minute from  
LOS, and next station contact will be through Quito  
in 28 minutes. See you there.  
ACDR Okay.  
13 28 54 CC-H Have a long rest period for both of us to get some  
breakfast.  
ACDR I never got up early except ... during Apollo 6. ...  
CMP I could probably ... this way.  
ACDR Yeah.

CMP ... get us busy on those ...

USA (Music)

13 32 29 ACDR Yeah.

DMP Oh, shit!

ACDR What happened?

DMP I spilled some ...

DMP Yeah, ...

13 33 05 ACDR Yeah. Yeah. ...

CMP I got a ...

DMP Well, maybe ... out of there.

ACDR Right up here, Deke.

13 36 04 ACDR You better go for ... that's all there is to it.

CMP I don't know, I think we can leave it up there. ...

DMP ..., Tom.

ACDR You got ... garbage bags over here?

DMP No. Throw away ... I'm going to have to ...

13 36 37 ACDR ... throw that towel back there, right? ... throw that towel away.

DMP All right, here it is here. ... we have two or three other - well we have to have ...

ACDR Okay.

USA (Music)

DMP Tom, I think there's a ...

ACDR What?

DMP Where's that place that says ... Where's my ...

ACDR Okay.

DMP You got it ...? It's a little high.

CMP Hey, Deke.

13 41 47 DMP Yeah.

CMP I think I can ... this one. That's to your right, I think, Tom.

ACDR No. ...

13 42 53 CMP I don't know. Let's - -

ACDR ...

CMP Yeah, I don't know why.

CMP Oh. No, ... don't worry about ... I can ...

ACDR Yeah, go ahead.

CMP ... we get the ...

13 44 04 CMP Hey, Tom, when do they want that ...?

ACDR Want to do it now?

CMP Might as well wait, I guess. I was going to do it but - ... I can do that now.

ACDR ... Yeah.

CMP Yeah. Urine's dumped, and we've already done all that ...

ACDR What about ...

13 44 49 CMP Oh, there it is. That's - I'll start the water dump ... It's only been on a short time.

CMP (Laughter) ... right here, Tom. You got ATS set up?

CMP Hey, Tom?

ACDR Yeah.

13 45 54 CMP I'll show you where I want to - to get those canisters changed.

ACDR I've got a ...

CMP Yeah.

CMP 18. Yeah. That's right. And you stow 16.

ACDR Okay.

CMP Funny thing. The very last canister I picked up there was the right one. ...

CMP You know, I have to ... this thing. Never ... the LiOH canister ...

13 47 30 CMP Okay. The canister's changed, Tom. Here's your tool E back.

13 48 23 ACDR Waste water dump in progress?

CMP No. I was wondering if it's been 20 minutes yet on the heater?

ACDR Yeah.

CMP Yeah? We did 20 minutes on the purge heater?

ACDR Well, the waste water dump ...

CMP Yeah. That's all ... been cleaned out before we start that. Oh, yeah. Oh, yeah, you're right.

ACDR ...

CMP The ... Okay. You ready to go?

13 49 05 ACDR ... We've got - we're down to 6 ... Wait till we talk to the ground.

CMP All right. ... water's ... on time anyway. When you check it off, ... they'll bring it up ...

ACDR Okay.

CMP Okay. What else we got?

ACDR Yeah.

CMP Yeah. Okay. ...

CMP ... I think we have one more.

13 51 05 ACDR Do you have it straight on the pitch?

DMP Yeah.

CMP ... up here.

ACDR Deke, ...

DMP Yeah.

CMP ...

ACDR Better wait for the ATS. We got the uplinking set up ...?

CMP Oh, ...

13 51 44 ACDR What - Deke, what camera ... the pictures? Is it still up there?

DMP ... number 20.

ACDR 20.

DMP Yeah.

ACDR Okay; ...

DMP ...

ACDR Yeah.

CMP Oh, Tom.

ACDR Yeah.

CMP ... it said right here to ...

ACDR ...

13 52 44 CMP Say again?

ACDR What's the ...?

CMP 22.

ACDR You got that ...?

CMP ... 58, 59.

CMP Okay. ...

13 53 44 ACDR Take the portable light and ... off.

CMP Oh, yeah.

ACDR \*\*\* Did you hear what Crip said, ... the light ... follow the light. Well, maybe we better wait until we get station contact. I tell you what you can do, Vance - or I'll start doing it. Are all those - that dim light - are all those ... up here. ...

CMP Yeah. Yeah. ... get height measurements - get that real fast.

ACDR The height measurements, somebody stay on the ... You do ... height measurements there.

CMP Okay. ... I was wondering if you could ... a count.

CMP Yeah. I got it.

DMP ...

ACDR ...

13 55 00 DMP Yeah. ...

ACDR ... Oh, Vance let go of his ...

CMP Yeah.

ACDR We got a ... that we like better.

CMP Yeah.

ACDR ...

DMP All right.

CMP Okay.

13 55 39 DMP Okay; set clocks. Get ready to ... when clock is set.

ACDR No, we don't need them.

CMP Oh, yeah. That's right.

14 56 06 CMP Well, we can stash it in here but ...

ACDR Let's try this one.

CMP ... on there.

ACDR All we need is one.

CMP Yeah. Let me have the ...

DMP ...

ACDR It's got about ... left on it.

14 56 22 CMP Star is Atria, 34, Tom.

ACDR Which one?

CMP 34.

ACDR Okay.

14 56 35 CMP All balls; plus 112, minus 104, minus 32.

ACDR All right.

CMP 3 ...

ACDR Okay. Got it ...

CMP ... Except for ...

ACDR Is it back to AUTO?  
CMP I'll see. ...  
ACDR Yeah. Get that squared away. You have your option ...  
CMP Okay. ...  
ACDR Squared away on it, Vance?  
CMP Yeah.  
ACDR You don't have any ... do you?  
CMP Not to my knowledge.  
ACDR I'll get down here ...  
CMP There's that ...  
CMP You got it?  
DMP Okay. Just a second.  
CMP Okay. ...  
DMP Okay. Take it.  
13 57 29 CMP Okay. ... get that last - that last - Well, it was pretty questionable.  
CMP Okay, Crip. Got you loud and clear.  
13 57 46 ACDR ... camera

TIME SKIP



ACDR ... Yeah.

CMP ...

ACDR All right.

14 58 01 CC-H Apollo, Houston. We're with you on VHF for about 5 minutes here.

ACDR ... inside that ... control?

DMP Oh, I don't know.

CMP Okay, Crip.

CMP I've got a fine ... pen.

ACDR Still don't know.

CC-H And, Vance, you know - no need to acknowledge if you're working on 52 there. We did not see detector 2 selected on that EUV when we went over the hill. Just a reminder, Vance.

CMP All right. I couldn't hear you, Crip. You're too weak. Please repeat\*\*\*

CC-H Roger. We're saying, did not see detector 2 on the EUV. If you get a chance, you might reselect that for us.

ACDR Okay.

14 58 49 CMP Okay. Now we're reselecting detector 2.

CC-H Thank you.

CMP Okay. Did you see her?

CC-H We're VHF and don't have data right now.

CMP Okay. Well, we can try it again.

DMP Hey, Tom, did ...? Do you know?

ACDR Yeah.

DMP ... five.

ACDR Well, we ... 5 or 10 ...

DMP You're going to end up with a whole cockpit full of -

ACDR Yeah. That's what it is.

DMP ...

CMP Yeah. Okay. I think ... you got the checklist?

DMP Yeah, I do, but I ... down here is the problem. ...

14 59 38 CMP All right.

DMP ...

CMP Okay.

DMP Yeah. Tom?

ACDR ...

14 59 53 CC-H Apollo, Houston. We're 1 minute from LOS; going to see you in about 30 minutes at Quito.

CMP See you at Quito.

ACDR ... another five ...

DMP Okay. Now ...

CMP Okay. I'll be down here in this cockpit ...

15 00 19 DMP Okay.

# TIME SKIP

15 33 05 CMP Okay.

15 33 09 ACDR Okay, Crip. I got the DOPPLER RECEIVER OPERATE on, exactly on time, at 195:03:00.

15 33 17 CC-H We're going to go over the hill here shortly. Pick you up again at MILA in about ...

ACDR I've got to check the bags.

DMP Let's see, I wonder if somebody could hand me some  
Velcro straps ... or tape. I got to - -

CMP Which would you prefer?

DMP Well, may need more than one ... the straps ...

CMP Okay.

DMP I got the coiled up hose ... stash it here. ...

15 33 48 CMP Okay. I'll help you.

DMP ... disconnect it here. ... separately.

CMP Yeah.

DMP ... all together. All together ...

CMP You still got the wrong one.

DMP Okay. This one here ... separate bag ...

CMP Okay. You got one of those rascals there.

DMP Yeah. Got one right here. They're holding much  
better.

15 34 35 CMP Okay. And we're going to do - just a ...

DMP That's almost right ... That ...

CMP Okay. Unless you want another one there.

DMP No. That's ... one ... Stuff her in a bag here.  
That one. In fact, we ought to ...

CMP Right.

DMP Down here ...

CMP There's another one. Bag ...

DMP Right. ... in here.

CMP You must have - got you one above your head.

DMP Uh! Let's see what's next on the list over here.  
 Okay; 61. I was under the impression ... camera  
 cable.

15 35 50 CMP Yeah. We got that out this morning, and I'll toss  
 it up to you. Okay? Where's that Russian [?] cable  
 there, Tom?

ACDR Up behind me.

CMP Okay.

CMP ... somewhere else.

15 36 08 CC-H Apollo, Houston.

TIME SKIP

16 30 50 ACDR Okay; it's done.

16 30 55 ACDR Check it in 15 minutes. Roger.

ACDR Yeah, we're still working.

DMP ...

ACDR That - that ... going to come up, Vance? That ...

CMP Yeah. Finally. It's up to 4.7 - 4.6.

ACDR Okay; that's - -

16 31 57 CMP Is that ...

DMP Okay.

CMP ...

16 32 14 DMP (...)

ACDR (...)

DMP ... it's going nowhere.

16 33 25 DMP ... Let's see; it's not there.  
DMP ...

16 33 51 DMP ... There. Now we got it.  
CMP In just a little more.  
DMP The ... thing is ... going back - oh, a little more.  
CMP ... be climbing around.  
DMP Yeah. ... get it into the bag. ...

16 35 31 ACDR That Doppler thing working yet?  
DMP Yeah.  
CMP Yeah. I just ...  
ACDR Okay. ...  
DMP ... this jettison bag.  
CMP Where do you tie it up at?

16 35 49 DMP Against the furnace valve box and tie it down with  
the rope ... rings ... wall.  
CMP Furnace box.  
DMP ... let's see. ...

16 36 23 CMP Where is it down here? Oh, I - I've got it. There  
you go.  
DMP Okay. ...  
ACDR ... up here ...  
CMP Yeah.  
DMP ... rings is what I'm looking for. ... there.  
CMP Tom, what do you want me to do with those ...  
ACDR ... yeah, ...

DMP ... for this bag ... here.

CMP ...

16 37 52 ACDR ... hold this one for you? I've got ahold - Yeah, ...

DMP Okay. ...

ACDR That'll hold.

DMP ... tie it up in here.

ACDR ... D-rings?

DMP Yeah.

16 38 19 ACDR Vance?

CMP Yeah.

ACDR ...

CMP Not yet. We have to wait - -

ACDR ... attitude.

DMP Okay. There we go.

16 38 59 DMP Okay. There. ... down ... I think we're better off to keep ... like this. That way we avoid ... We want it ... right attitude.

16 39 32 DMP ... over here. That's right.

DMP Yeah.

ACDR There. I've got it.

DMP Oh yeah? ...

16 39 57 ACDR ... think they're blocked ...

CMP ... your head ... here's one more ...  
 ACDR ... I got ...  
 DMP Now they're ... coming around ...  
 ACDR Yeah. Okay.  
 16 40 23 DMP ... stow it ... put it ... back up in ...  
 ACDR No, no. Now they're ... again.  
 DMP They are?  
 ACDR Yeah. Get me another rope.  
 16 40 37 CMP What? More rope?  
 ACDR Yeah.  
 DMP ...  
 ACDR Tie it back ... Let's go ahead and ... those ...  
 DMP Okay, let's tie that one off. ... We're better  
 off tying that from over there ...  
 CMP ...  
 DMP ...  
 16 40 54 ACDR How's that ...?  
 DMP ... another one over here ...  
 DMP ... tight. There. That ...  
 CMP Now there, ...  
 DMP ...  
 CMP ...  
 16 41 54 ACDR ... don't get it, ...  
 DMP Yeah. Try and get her up and move her back ... back  
 in the ... bag. ... cable's down in here - -

CMP            There's the cable you sent back; another extension  
                  cable, right?  
  
 DMP            Oh - -  
  
 16 42 19    CMP            I just found a ... cable ...  
  
 DMP            Yeah, okay. I got ... here.  
  
 CMP            Okay.  
  
 DMP            ...  
  
 16 42 52    CMP            Can I help you pull on that?  
  
 DMP            Yeah. In a minute. ... I have to go ...  
  
 DMP            There. ... That ... not going anywhere ...  
  
 ACDR           ...  
  
 DMP            ...  
  
 16 44 51    ACDR            ... Where's your checklist?  
  
 CMP            Right here. ...  
  
 DMP            ...  
  
 CMP            Okay. We're right at the time when we're supposed  
                  to be.  
  
 DMP            We are?  
  
 CMP            Yeah.  
  
 16 45 10    ACDR            Okay. ... You got the Docking Module Checklist?  
  
 CMP            No, I don't think - -  
  
 ACDR           You got it, Deke?  
  
 DMP            No, I'm not supposed to have it. ...  
  
 ACDR           ...  
  
 DMP            Okay. ...



16 45 41 ACDR Okay. Let's get this - DOPPLER TRANSMITTER,  
OPERATE ...

DMP ...

ACDR Okay ...

DMP ...

16 45 52 ACDR ... about the attitude. ... verify the following  
items - it says, "All items are secured." The O<sub>2</sub>  
REGULATORS ... they OFF?

DMP You got them. REGULATORS A and B are OFF.

16 46 15 ACDR Perform hatch 2 closure. Decal, step 1 to 4.

DMP ... we can close the hatch.

ACDR ... the latch ...

DMP ... I suppose. Better get the hatch ...

ACDR ... better close that from the inside ...

DMP Yeah. ...

16 46 38 CMP Don't - don't pull ... the umbilical.

DMP That's below ...

CMP Okay.

DMP ...

CMP Yeah.

DMP Supposed to be on panel 900.

ACDR ... close that vent valve ...

DMP Oh, the vent valve should be closed.

ACDR Yeah. Yeah.

16 47 02 DMP Yeah. I thought you were talking about ... Yeah,  
I ... There, got it closed. ... got a problem.

CMP Yeah. ... got a problem.  
 16 47 31 DMP ... Okay. Now we close the hatch.  
 ACDR Number 1, ... valve ...  
 CMP I'll tell you one thing, if they don't tell us to pull those umbilicals, we're going to pull them anyway.  
 ACDR Yeah. Here. Even though the ... up here.  
 CMP Yeah, I know. You never know what ...  
 16 48 02 DMP Okay, old DM, goodbye. Okay; closed.  
 CMP Good.  
 ACDR ... hatch ... cable bag on top of A-1.  
 DMP Huh?  
 ACDR Yeah, bring that bag here.  
 DMP Okay. Got it.  
 ACDR On panel 900 - -  
 DMP ... as soon as I get the ... here. Okay. I'm on panel 900. Panel 900.  
 16 49 04 ACDR DM VENT ISOLATION, OPEN.  
 16 49 07 DMP ... OPEN.  
 ACDR DM VENT to VENT.  
 16 49 09 DMP DM VENT to VENT. Okay. ...  
 ACDR On panel 274, circuit breaker DM POWER, OPEN.  
 16 49 27 DMP DM POWER A and B, OPEN.  
 CMP Is that all?  
 ACDR Yeah.

ACDR Okay. Install, unstow hatch 1.

CMP Yeah. I'll do that. Okay.

DMP Right, ...

CMP Yeah. ...

DMP Okay. Boy, I'm really sorry that's gone. ...

CMP Yeah.

16 50 13 DMP They don't say disconnect umbilical.

CMP No.

DMP ...

CMP No. It's really - The only thing is you have to go back ... I'd ...

CMP Want ...?

DMP Disconnect ...

CMP ...

DMP Yeah. ...

CMP ... before we ...

16 50 53 ACDR ... Hey, Deke?

DMP Yeah.

ACDR ... not going down right away, is it?

DMP Well, not before ...

CMP It's going down, though.

DMP Yeah. A little ...

CMP Yeah, Tom, ...

DMP ... wouldn't make a difference ...

ACDR ...

CMP We're going to turn all that off ..., though.

DMP Oh, I see. ... - -

16 51 32 CMP Turn it off at 197:20. But I'll tell you, I'm going to ... turn it off ...

ACDR Going through with the checklist? I'll see. Yeah. Hatch 1 pressure integrity check. ...

DMP Okay. ...

CMP ...

ACDR Yeah. ...

DMP ...

CMP Verify - Yeah, it's coming.

DMP Okay. ... we've lost all of our ... (laughter) ... all over ...

16 52 38 CMP As a matter of fact, Tom, was wondering if ... checked ...

CMP ...

CMP Yeah.

ACDR Let's see, we got 3 hours ...

DMP All right. ...

DMP ...

ACDR Set the HIGH GAIN on ...

DMP Okay.

16 53 54 ACDR Pitch, minus 44; yaw, 193.

DMP Pitch ... Now let's see ... 15 minutes?

CMP Yeah. ...

DMP How you doing?

CMP Oh, I'm ... I got one of them, though. ... we just take one of them, okay?

16 55 41 DMP Okay.

ACDR What we got, 7?

CMP We got 4. I just ...

ACDR All ...?

CMP Pretty ... for the ...

DMP ... interesting.

DMP ...

16 56 27 ACDR That ain't going to hack it, Vance.

CMP Huh?

ACDR Here, look at the ...

CMP Okay.

DMP ...

CMP We got two more. You want them?

ACDR Yeah, bring them here.

16 57 05 DMP Okay, here's your ...

CMP Thank you.

ACDR What is that? ...

DMP ...

CMP Wonder if ...?

ACDR ... down here?

DMP ...

CMP Think I already did it.  
 ACDR Got it? Okay ...  
 CMP Tom?  
 ACDR Yeah.  
 16 58 06 CMP Give me the scissors. I've got to cut a wire here  
 that's ... just a little.  
 CMP Go ahead.  
 DMP ...  
 CMP Hey, there's a wire in here that I have to cut.  
 ACDR Cut it.  
 CMP That's a good one.  
 ACDR Got all fof them?  
 CMP Yeah. Now let's get the hatch.  
 ACDR ... help ... that, Vance?  
 16 58 57 CMP Oh, don't think so. Well, we'll wait and see here.  
 ACDR ... all around in that hatch. Push. Yeah, let me  
 help you with it. Okay. ...  
 CMP Yeah, I know. Got a Kleenex? ...  
 DMP ... Let's see ... Here's one coming up.  
 CMP Okay.  
 16 59 35 ACDR ... checklist?  
 DMP ... we had it ...  
 DMP ... the right page.  
 CMP Yeah, it is the page that ... hatches ... first  
 part ...

DMP ... really works ...

17 01 01 ACDR That's good.

CMP Yeah.

ACDR Finished?

CMP Not quite.

ACDR Can I help you any?

CMP ...

17 01 20 CMP Okay; the PRESSURE EQUALIZATION valve is CLOSED.  
The ... locked and all the valves look good. ...  
we're in good shape.

DMP Let's see, verify pressure integrity ...

CMP Yeah.

DMP Supposed to verify pressure integrity ... - -

CMP I know. You said ... decal.

DMP ... the checklist. It's in the ... here. ... Is  
that it? Huh? Which checklist ...

CMP Uh huh. How about - I know how to do it, but how  
about checking the pressure.

DMP Pressure.

17 02 05 CMP Yeah. And also DM VENTILATION.

DMP ... VENT valve?

ACDR Huh? We got it.

DMP ...

CMP Okay. How about over in - -

DMP Yeah. That's probably where it is. ... the last  
thing we really want. ... had it last ...

CMP And I put it ...

DMP The thing is ...

17 03 22 ACDR ... put it up here ... had to get up ...

DMP Okay. ...

CMP Well, while you're looking, why don't I proceed ahead, and ... check it ... down ... down ...

DMP Well, ... get up there, you know. ...

CMP Oh! Here it is. Never mind. I think we still have to find that thing but - here's, "Verify cabin pressure ... 4.7 to 5.3."

ACDR Got it. ...

17 04 42 CMP Okay. TUNNEL VENT for 30 seconds.

DMP ... Over here, Tom.

ACDR What?

17 05 47 DMP Yeah. I wonder what ... ..

CMP That ... cabin pressure ... Well, I guess, the O<sub>2</sub> FLOW HIGH ...

17 06 05 ACDR Try her anyway. ...

17 13 53 ACDR Hey, Crip. ... He's off.

CMP He's off?

ACDR ...

CMP No.

DMP ... make sure it retracts.

ACDR ... .. Wait, wait, wait, wait. ...

DMP ...

17 14 49 DMP It's not on yet.

TIME SKIP



18 02 59 ACDR Right. Good. Very good. ... Yeah. Yeah.  
 CMP ... rack.  
 ACDR What?  
 18 03 28 CMP ... here. ...  
 18 05 46 ACDR Right here.  
 CMP Okay.  
 DMP Okay.  
 18 08 06 CMP Maybe it was. Is that ...  
 DMP You ...  
 CMP Okay. That's fine.  
 ACDR All right.  
 18 10 11 CMP Okay. That's good. ...  
 18 16 26 CC-H -- tact in 19 minutes, through Goldstone, at 198:13.  
 198:13.  
 18 16 34 CMP Okay, Crip. See you there.  
 DMP ...  
 CMP ... ... down to 6.  
 DMP ...  
 CMP 6.  
 DMP ...  
 18 19 53 CMP Oh, it's - it's on their plane, I guess. Pitch and  
 yaw's ... Yeah, here it is. Minus 53 pitch, and  
 yaw's 162.  
 ACDR How do you read, Vance?  
 18 20 11 CMP Fine. Yeah.  
 18 22 18 ACDR Testing. Testing ...

CMP ...  
 ACDR Yeah. I've got to get ...  
 CMP Okay.  
 CMP ...  
 18 24 14 ACDR ... Yeah. ...  
 CMP ...  
 ACDR Okay. ... ..  
 CMP Well, yeah. ...  
 18 24 48 ACDR Let's see, ...  
 ACDR ... Let's see, ... Let's see, which ...  
 18 26 44 CMP ...  
 ACDR ...  
 CMP ... reverse ...  
 ACDR ... We're ready.  
 CMP ...  
 ACDR All right.  
 18 27 38 ACDR Are you trying to get down?  
 CMP Huh?  
 ACDR You trying to get down?  
 CMP What?  
 ACDR Pitching down?  
 CMP Yeah.  
 ACDR Got your verb?  
 CMP Yeah. I got it.

18 28 46 DMP ... install these things.

ACDR You've got all - -

CMP You've got ...

18 28 56 ACDR You've got all these things ...

18 29 45 ACDR There ain't much more left, is there?

ACDR Have we switched to high gain yet?

18 30 58 CMP I pulled it up; ...

18 32 04 CMP Okay. Pitch up?

ACDR Yeah, ...

DMP Okay.

18 33 55 ACDR No, you sure ... a lot of ... steady. That it?

DMP Oh, boy. ...

18 34 56 ACDR You don't have to do that.

18 37 21 CC-H Be advised I'm reading you pretty weak. I guess your mouth is a little bit away from the mike there. Probably kind of hard to do it. We're about a minute from LOS, and - -

ACDR Yeah.

CC-H - - see you at Rosman here - correction, see you at Newfoundland in about 8 minutes.

18 37 37 CC-H Somewhere along in there, it'd probably be better to wait - -

CMP ... do that.

CC-H - - until you get to Madrid, I'll give you an update on your - your DMI - well, I'll give you the DMI pad.

CMP Okay. Well, pitch is down.

18 37 54 CMP Yeah, if we could get that before we get buttoned up in suits - -

CC-H Well, I - I've got it whenever you want to - got a convenient time to copy it.

18 39 06 CMP Okay; ready to copy the - DMI pad.

CC-H Why don't we - we'd better - we're going over the hill here. We'd better wait until we get to New-foundland, Vance, I'm afraid. It's 6 minutes from now.

18 39 17 CMP Okay.

18 41 38 DMP Okay. ... check.

18 43 41 CMP He should have ... off. Tom, if you can get the ... off temporarily.

18 43 53 CMP Off. Uh-huh. Change the other one. See? You get a - -

ACDR Let me know when you're ready.

CMP Okay. Just a second. Deke's got a little problem. It's caught in the trunk. You've got to pull it all the way off.

CMP Okay. You've got to pull that thing off to start with.

DMP ... twisted or something.

ACDR Got it in? Finally got it off, huh?

ACDR ...

DMP ...

18 44 32 CMP There you go.

DMP Okay. ... lift up. You can't see that God damned thing in there.

CMP Maybe I can get it off ...

18 44 56 DMP Hold it, ...

ACDR What?

DMP Tom, your suit's ...

CMP Yeah, ...

18 45 06 ACDR Here it is if you want it off. ... the helmet ...

18 45 20 CC-H - - Houston. We're AOS through Newfoundland. Should be with you ... of about ... with the ATS.

ACDR ... O<sub>2</sub> is off. How do I ...

CMP I don't know.

18 45 54 CC-H Apollo, Houston we're with you through Newfoundland, and if you're reading good enough, we can go ahead and try to get this pad up.

CMP Okay. Stand by.

CC-H Okay. No rush.

ACDR What pad's he on?

DMP Let's see. I think it's ... I don't know for sure. ...

DMP Okay.

18 47 15 ACDR Hey, Vance, push on it ... I think that's ...

ACDR It ... off.

CMP Yep.

DMP ...

CMP Okay. Let's go on and ...

CMP Yeah.

ACDR Okay. Why don't you ... off?

18 47 39 CMP Wait a minute. Let's get this set up first.

TIME SKIP

19 46 08 ACDR Wait 15 seconds. You want CMC, HOLD, 5 and 1.  
 CMP Understand.  
 ACDR All right. ...  
 CMP Okay; and we're going to 210 on the 180 - 180 to go.  
 ACDR All right. ...  
 CMP I'm going to have to read that.  
 ACDR Read that. At 180, coming in about right. Looking good. Okay. 30 seconds.  
 CMP Yeah.  
 ACDR Okay.  
 CMP I'll give you a countdown.  
 ACDR ...  
 CMP 20 to go.  
 ACDR 20 to go. Continue looking good ...  
 CMP 10 seconds to go.  
 ACDR Yeah.  
 CMP I'm going to give you a mark.  
 ACDR All right. Stand by.  
 CMP Okay. Just about ready. 4, 3, 2, 1 -  
 19 47 03 CMP MARK. Beautiful.  
 DMP There she goes.  
 ACDR Okay. That thing ...  
 CMP ...  
 ACDR Okay. Attitude ...  
 CMP Right.

ACDR CMC, HOLD.

CMP Now.

ACDR Okay. 5 and 1.

CMP ... You see it?

DMP It went out to the left there.

CMP Okay. Need a hack in 1 minute, Tom.

ACDR Okay. I'll get a hack in 1 minute. FDAI 5 and 1.

CMP 5/1?

ACDR Yeah.

CMP Okay; we're waiting for it.

ACDR Okay. Okay, at 1 minute. It's 37, 38 seconds. Flip those PYROs, OFF, real fast ...

CMP ... okay.

DMP I'll be a ...

CMP Okay. And got to search for it, I guess.

ACDR Okay. At 1 minute, Deke, CAMERA, on.

CMP ...

ACDR Stand by.

19 48 06 ACDR MARK it, 1 minute.

CMP Okay. She went off real good, Crip. We don't see her in the window yet. We went to HOLD at 15 seconds.

CMP I - we want to get those pictures though, too.

CMP I think I'm going to have to go right. You can't see it out of any window, huh?

DMP No, I don't see - -

ACDR Nope, I don't see a fucking thing here.

CMP Well, let's see. I think it's to your left.

ACDR Okay. Our pressure's good. Want to pop off these suits and look for it.

CMP Our pressure's good.

DMP Well, I don't know where to look.

ACDR ... better look out ...

CMP I'd rather kind of look for it - Well, that's right, we should pop off here.

19 48 42 ACDR Okay, Crip. Pressure's looking beautiful here. ... pop these suits and helmets and try to look for the bear.

CC-H Okeydoke.

DMP It might be to your left, but I don't know.

CMP Okay.

CMP Okay.

DMP That's where it was the last time - -

ACDR Yeah, on the left. Along with ...

CMP Yeah. Okay; I see it.

ACDR Okay.

CMP Go get a - -

DMP Okay. Master alarm; it's O<sub>2</sub> HIGH FLOW. We'd better watch ...

CMP Yeah. That - that looks like ... circuit breaker.

DMP Yeah, circuit breaker.

ACDR ...

CMP Huh?

CMP Okay, Tom, would you ...



19 49 37 CC-H Okay; we're a minute from LOS. Our next station contact will be Goldstone in 18 minutes. That's at 199:46. Good luck on spotting it.

DMP Okay. We got it now, Crip.

CC-H Very good.

ACDR He has trouble seeing them.

DMP How's it going there?

CMP No, I see them ...

ACDR Oh, I'm sorry. Now you see them ... The reflected sunlight in this son of a bitch looks like an earth-shine.

CMP Not in the right direction.

19 50 08 CC-H A little reminder, when you get to it, to get the SUIT CIRCUIT RETURN, OPEN, but no - no rush.

DMP Turn on the which?

CMP All the way?

ACDR Suit valve?

CMP No.

CC-H ... RETURN valve. We monitor it CLOSED now. That was the reason for the O<sub>2</sub> FLOW.

DMP Okay.

CMP Okay. I hope we can ... I got it.

DMP Yeah. Camera's running.

CMP Okay. And I'll get that SUIT CIRCUIT RETURN valve.

ACDR Okay.

CMP ...

ACDR I should have ...

CMP ... try it. Yeah. Okay; I don't have any ... I don't have any at all.

ACDR No.

CMP ... wants - -

ACDR Looking down on Earth, to check on my pitch just like that - -

CMP Not even a hint of a - -

ACDR That's right. ... make sure I got the right one ...

CMP No.

19 51 13 ACDR That's right, man. It wipes you out completely.

CMP Yeah. I don't have any.

ACDR (Laughter)

ACDR See, what I was - what went on on that first ... docking ...

DMP And the second one.

CMP Hey, Tom, how long did you keep it heads up?

ACDR Okay. For 8 minutes.

CMP Okay. Now it's holding very steady. We got it.

DMP ...

CMP That worked real good. ...

ACDR All righty. ... Go ahead and get your SECS LOGIC, OFF.

19 52 04 CMP Okay; understand. SECS LOGIC, OFF ...

ACDR ...

CMP God damn. That was fun.

ACDR Circuit breaker CSM/DM FINAL SEP, OPEN.

19 52 24      CMP      That COAS is just ... camera.

ACDR      ...

DMP      Changing film here. I got - got the long lens.

CMP      I'll have to remember that, ... not that it matters.

ACDR      ... nobody ever had this problem before. ...

CMP      Haven't had the - -

ACDR      Haven't had the problem all the time, but ...

CMP      Well, but they gave him a filter. Would - would that help?

ACDR      No. Won't help ...

DMP      ...

CMP      Yeah. ...

ACDR      ... suppose to have ...

CMP      I think it looked like it was going to have ...

ACDR      Yeah.

CMP      ... right direction ...

19 53 40      ACDR      I guess the Hasselblad is ...

DMP      No, I got it over here where - -

ACDR      Let me help.

DMP      (Laughter) I'll - I can get it.

ACDR      ...

CMP      Look at that.

DMP      Should be set ...

CMP      Okay. I've got that on vertical now. Now I've got to ...

CMP Shoot one out your window?  
 DMP Well, no. I can try it, but I'll have to turn these lights ...  
 ACDR No, I don't want you to do that.  
 ACDR ... your hand away.  
 CMP ...  
 ACDR Hold it to the left a little.  
 CMP Yeah.  
 CMP Deke, there goes your burn.  
 DMP (Laughter) Yeah. ...  
 CMP Sure, Deke?  
 DMP Okay. Well, ...  
 CMP Okay. ... DAC.  
 19 55 20 ACDR DAC. Okay. Configure DSE LOW BIT RATE, FORWARD - -  
 19 55 29 CMP DAC off? DAC off, Deke?  
 19 55 35 DMP Yeah.  
 CMP Hey, you know, it's kind of - -  
 19 56 35 ACDR ... Why don't you put all of it in that.  
 CMP - - got to push it down. I don't know, but I think you should push it down. That's probably ...  
 ACDR ... that's beautiful.  
 19 57 12 CMP ... the right gimbal lock.  
 ACDR Looks good.  
 CMP Okay; look ahead ...

ACDR ... further down and get that DAC off before we get the SECS PYRO at 8:30 ...

19 57 56 ACDR Okay; VERB 48: 11102 [sic] ... 11102, ... Oh, hold it, hold it, hold it. 11002.

CMP Yeah. ...

19 58 17 ACDR Let's see, ... CMC, AUTO and VERB 49 maneuver to the DMI pad attitude ... Okay; this is it. Okay. Roll plus 358, ... 351, ... 003.

DMP ...

CMP PYRO ...

DMP ...

ACDR ...

DMP ...

ACDR Yeah.

CMP Verify ... - -

DMP ...

CMP Oh, yeah.

DMP Oh, okay.

CMP ... put it.

19 59 45 ACDR ... CABIN PRESSURE INDICATOR, verify greater than 4.7 ... EMERGENCY CABIN PRESSURE on BOTH. SUIT CIRCUIT RETURN valve ...

CMP Okay.

20 00 08 ACDR Okay. 99:35, G&N OPTICS, ON. P30, verify DMI T<sub>ig</sub> and delta-V.

CMP ...

ACDR ... the DM ... Yeah, that's it. 200, 00, 00.

CMP ... 38 - 39.

20 01 41 ACDR All right. Let's see. Why don't ...  
 CMP ...  
 ACDR ...  
 DMP ... have to ...  
 20 02 31 CMP Yeah. ... we'd have to be ...  
 ACDR ...  
 CMP I'm not ... I still ... I think if I turn up  
 that ...  
 ACDR Yeah. That ...  
 20 03 01 CMP ... make it easier.  
 20 03 06 ACDR It really looks good up here.  
 CMP ...  
 ACDR ...  
 CMP ...  
 DMP ...  
 20 04 10 CMP I've got to ...  
 ACDR ...  
 CMP ...  
 20 04 24 ACDR You there?  
 CMP Yeah.  
 ACDR ...  
 DMP ...  
 CMP ...  
 ACDR ...  
 20 06 02 ACDR Hello, Houston; Apollo.

ACDR ... locked up on ATS.

CMP ...

20 06 27 ACDR ... pitch is minus 58.

CMP Yaw.

ACDR Yaw is 334.

CMP ...

20 07 51 ACDR Yeah, that's good pitch we got. We got 300 ...

CMP ...

20 11 19 ACDR You got a map over there, Deke? ...

DMP ...

ACDR I don't have one. ... Vance, you have a ...

20 11 34 CMP Hell, I guess ...

ACDR ...

CMP I think it's over in ...

ACDR I guess - Why don't you - -

20 11 47 CC-H Apollo, Houston. We're looking at some data down here that shows circuit breakers on panel 274, for the DM FURNACE/CRYSTAL GROWTH are closed. We would like to get those opened, if we could, please. If you can reach them. We're about to go LOS, and then we'll have you again at Newfoundland in 5 minutes.

DMP ...

CMP ... Tom?

ACDR Yeah.

CMP ...

DMP ...

20 12 01 ACDR Yeah. We'll get a bigger bag ...

ACDR ... 18:10 ... should not be too long.

CMP Oh, we got about 19.

ACDR Where do you see that?

CMP ...

ACDR ...

DMP ...

ACDR ... Okay.

ACDR ...

20 14 14 ACDR ... all over ...

CMP ...

CMP ...

ACDR Yeah.

20 15 23 ACDR Shit! Do you know what ...?

CMP ...

ACDR ... that panel ...

CMP Okay, Deke, ... Flight Plan ...

DMP Yeah.

20 16 52 ACDR ... GET.

CMP ...

ACDR ...

CMP ...

20 18 04 CC-H Apollo, Houston. AOS Newfoundland, 7 minutes.

CMP ...



20 18 17 CC-H And if you gents find a chance to get those ATS angles, a pitch of minus 58 and yaw of 334, we'll be able to get you on the ATS and watch you burn.

DMP Yeah. I had them in there. I hope you got it.

CC-H Okay, fine. Well, we're not quite there, yet. Thank you, Deke.

DMP Okay. That 274 breaker I can't get at.

20 18 37 CC-H Understand.

TIME SKIP

20 54 20 CMP Okay. Pacific Ocean - Ocean's just ...

20 56 07 DMP Yeah. ...

CMP All right, Deke.

DMP ... I don't think ... work ...

CMP ...

20 57 13 DMP Well, if you got to ...

CMP ...

DMP ...

DMP ...

20 59 38 CMP What? Yeah. Two. Morning ...; morning and ... Got to have - Do the ... power on.

DMP ...

CMP ...

DMP ...

21 01 22 ACDR You got the power on? ...

DMP Okay.

ACDR Hey, ... down in here. ...

DMP There it is. ... ..

CMP ...

21 03 06 DMP Look ...

21 03 26 DMP Let's see, ...

21 04 23 ACDR Hey, Deke?

DMP Yeah.

ACDR Where's that stuff for the electrophoresis ...

DMP I think I put them all up in ...

ACDR Yeah.

21 04 37 ACDR ... electrophoresis.

DMP ...

ACDR ...

DMP ...

21 10 34 CC-H Apollo, Houston. We are AOS through Orroral for 4 minutes.

DMP Okay, Crip. And we got the TV camera up and running.

CC-H Okay, great. We're talking at you on VHF now. As soon as we lock on with S-band, we're going to go ahead and command that camera on.

DMP Okay.

DMP ...

21 14 31 DMP Well, okay, Crip. We're over where we think we ought to be, about Sydney, and we're in solid cloud cover here right now.

CC-H Yeah. Kind of hard to pick a cumulus cloud out amongst all the clouds then, huh?

DMP Right.

CC-H Okay. Copy that.

21 14 54 CC-H Like to give you this quick blurb regarding the eddies I mentioned earlier south of Hawaii. It's known to have a series of eddies southwest of the Islands due to the current flow being broken by the Islands. And the size, and the number, and the extent of them are unknown. We'd like you to attempt to observe the orientation, the sizes, and how many you can see. You should have a chance to look at them on this upcoming pass across there at about 201:09. And we think it should be visible out of window 1.

DMP ...

21 15 28 CC-H We're also going to be, again, not beaming down this TV to Hawaii when we - when we come across there. So we can look at it later. We are 1 minute from LOS, and our next station contact will be at Hawaii in 14 minutes.

DMP ...

CMP ...

DMP ...

21 20 37 ACDR ...

21 23 02 ACDR ... The ballpark on it's approximately 1500 feet.  
... 250 ... too far off.

CMP ...

ACDR ...

CMP ...

21 24 35 ACDR Yeah.

21 25 03 DMP Hey, you know, we could ...

CMP ...

ACDR ...

21 25 21    CMP        I did?  
              ACDR        ...  
              DMP        ...  
              ACDR        ...  
              CMP        ...  
              ACDR        ...  
              CMP        ...  
              CMP        ...  
              ACDR        ...  
 21 26 44    CMP        It might have been. I don't know. ...  
              DMP        ...  
              CMP        ... are really ...  
              ACDR        ... Have I got it on?  
 21 27 12    CMP        Yeah.  
              ACDR        Oh, yeah. Yeah, here's ...  
              CMP        Yeah.  
              ACDR        ... ..  
 21 27 37    DMP        Okay, ...  
              CMP        ...  
 21 28 11    ACDR        ... up here, look at the - -  
              DMP        ...  
 21 28 55    CC-H        Apollo, Houston. Hello at Hawaii for 6 minutes.  
                              How you doing?  
              DMP        Okay, Dick.  
 21 29 01    CC-H        Hi, Deke.

21 35 17 CC-H Yeah. The ball is okay now.  
 CMP Right.

21 35 19 CC-H We just don't want to change that. (Laughter)  
 CMP Okay. ...  
 DMP No kidding, Tom. We've got on a ... Vance ... coming up here ...

21 35 39 CMP Tape recorder. ...  
 DMP ...  
 CMP ...

21 37 38 ACDR ... 35 ...  
 DMP ...  
 CMP Got to find ... I think.  
 DMP ...  
 CMP I just ...  
 DMP ...  
 CMP ...

21 39 11 ACDR It's darker at times. Like over there, it's darker to me than over here.  
 ACDR Yeah. Like I get about a 38 here.  
 ACDR Yeah. And over here I would get more towards a - 35 or 36. What do you get?  
 DMP ...  
 ACDR 48 is closer here, but over here 47 is closer.  
 ACDR Okay. Let's get this cockpit cleaned up here.  
 DMP Okay. Let me get this magazine shot.

21 40 07 CMP Yeah. We've got to reconfigure. We've got a lot to do in the next hour or so.

ACDR ... .. Yeah.

CMP ...

DMP ...

21 40 54 ACDR I tell you, ... got one big bag big enough to ...  
I hope ...

DMP Yeah. I agree with you. ...

CMP Okay.

DMP ... get a new mag on ...

21 41 19 CMP Okay, sure.

DMP ...

CMP ...

21 42 27 CMP I got to have gyres and stuff. ...

ACDR ...

CMP ....

21 43 24 ACDR Let's see. I'll tell you what, ...

CMP ... tape recorder ...

DMP ... Seattle ... ..

21 45 41 ACDR Yeah.

21 46 23 DMP ... That's the bag[?] right there, isn't it? ...  
bag[?] ... Know that? I don't understand that  
fucker. ... .. That's exactly what we needed,  
though. ...

CMP Yeah.

21 47 59 DMP Okay.

21 49 09 DMP ... some of that stuff ...

DMP That'll get there ...

21 50 45 DMP Well, ...  
21 52 48 CC-H Apollo, Houston.  
21 53 13 CMP ... Well, I guess ...

TIME SKIP

22 29 13 CMP Tom, it's good ... Did ... that?  
ACDR Get the ...?  
CMP Umm. ...  
22 34 35 ACDR Do you have one of these ..., Deke? ...  
22 38 12 CMP The other one.  
22 38 34 ACDR You want us to put it back, ..., all this?  
DMP Try to get ... in a bag. You all fixing to ... and  
all that?  
ACDR Yeah. Get the ...  
22 39 36 CMP The best thing would be ...  
ACDR ... Hey, this is a bag full of garbage.  
CMP ...  
ACDR We can get it ... all the fucking bags.  
CMP I wish you'd look at this ... here. ... first.  
ACDR Let's see, why - why don't you go back and ... that  
job that hasn't been ...  
22 40 16 CMP I don't know, but I think it's still around some-  
where. ... make sure. Right here. That's the only  
reason I hate to take it out.  
CMP Coming ...? Okay. I took 12 ...  
22 42 20 CMP Okay.

22 44 00 CMP Shit. ... Okay. We've got three shots of Australia ... and ... 12 in the checklist ... They were approximately ... of Australia and they ...

DMP ... God! Look at those ...

22 48 59 CMP Deke, did you ...? There's no evidence that that ... get out and ...

CMP But - I'm forced out of ... stereopair of ... and they ended up ...

CMP Would you take this?

ACDR ...?

CMP Yeah. This is a ...

ACDR ...

22 50 43 ACDR ... anyway it would be possible. ...

CMP Go ahead, Tom.

CMP What's that island? Okay. Do a ... Got ... of an island. Got water ... off the island.

ACDR ... the black one.

ACDR Why don't you just toss me the black one. ...

CMP ... let you know. We're over the Seattle area, ... photographs ... snowcapped ... stereo frames ... glaciers and firn lines and sediments - describe sediments in the waters of Puget Sound. ... gyres there? ... give you an idea of all the things ...

CMP I've looked at it, and I've decided that if ..., I can't describe them too well. And I've just got to take more pictures in the right ...

ACDR Ready to ...?

CMP ...

22 54 15 ACDR ... off.



CMP Stereopair of thunderstorms over the mid-Pacific at 202 ...

CMP Got another big thunderstorm ... .. what rev ...

DMP 123-24.

CMP Well, that should get it.

ACDR ...?

CMP Yeah. ...

CMP You know, I think we've made several passes ...

ACDR ... you're right.

ACDR I better get ...

22 58 05 CMP Well, let's see; if we were going right side up, let's look down here, right? ...., Tom.

ACDR Yeah. If you look ... south ...

22 58 59 CMP This pass ... There's a big one up in the ...

DMP Let's go down to the south.

ACDR One thing that caused the urine dump to go ... was ... while we're eating.

CMP Is that right.

ACDR The outside ...

22 59 46 CMP I noticed that thunder clouds come out of ... I mean out of eddies - or cumulus-type clouds. Okay; just got a - an eddy. Should read at 202:38:00. Right there, I got it in front ... it's right there. Sort of a ... of it. I see a slight extra ... of it. So light I can't hardly describe it. The - one other thing I noticed is out of the sky I just took a picture of there were cumulus clouds emanating out of the sides or the interior of it. You'll find that with several - I - I said sky, it ought to have been eddy - several eddies interior.

23 01 03    CMP    There's another big - Hey, look at that. That looks like a hurricane. Good Lord! Great big storm in the middle of the Pacific here, coming up at 202:38:10. Look at that swell. Okay; I got the center of this tremendously large thunderstorm. I don't know, it might be 100 kilometers across. Virtually, I can't even see the extent of it; more than that, I got a stereo ... the center.

ACDR    Yeah.

23 02 54    CMP    Okay; the time on that was ... 40:55. Oh, I thought you were just ... Got a picture of an island ... 202:41:10. ... sunglint around it. ... beautiful island with sunglint around it.

23 05 04    CMP    Looks to me like ... fixing to ...

23 05 47    CMP    Okay. That's 32 and 33. Typical, rather linear cloud pattern ... west. I see this quite a bit. ... water current. ...

23 08 34    CMP    ... I can sit here and ...

ACDR    ... Vance.

CMP    Oh, yeah.

ACDR    Yeah. I can see the whole thing from here. ...

CMP    Yeah, that worries me. It helps to see them right side up. ... Good.

CMP    Looks like ... here.

DMP    ...

CMP    ... looks like ... I think it indicates that ... That looks like a ... itself. It's got a ...

ACDR    Yeah. ...

CMP    Hey, Deke.

DMP    Yeah.

23 10 29    CMP        We got to identify ...

              CMP        Looks like it may be a "mega-eddy," huh?

              DMP        Yeah.

              CMP        Deke's picture was taken ... 48:45 ...

              ACDR        Huh? ... work better?

              CMP        ... turn it ... And could somebody ... get a ...  
                          place for ...?

              DMP        I don't know.

              CMP        ...

              ACDR        I really don't think so. ...

              CMP        ...

              DMP        Okay. ... get it.

              CMP        Okay. Here comes ...

              ACDR        You've got the ... You've got the ... all over ...

              CMP        Okay.

              ACDR        ... right now. ...

              CMP        How about way down south?

              ACDR        Way down there?

              CMP        Well, we can ...

              ACDR        Yeah.

              DMP        ...

              CMP        Well -

              DMP        ...

              CMP        Right here.

ACDR I still don't - don't think the camera's taking good pictures.

CMP ...

ACDR ... all that water down there.

23 15 08 CMP Took a picture ...5 of the Canadian Rockies. Snowy-area stereopair ... looking for glaciers ... Canadian Rockies ... glacier.

ACDR I was looking for one.

23 15 54 CMP Okay. I see a glacier.

DMP ... There's the firn line.

DMP Yeah. There it is.

CMP Okay, Deke, set the ...

DMP Huh?

DMP ...

CMP ... first is at 202:40 ... a big farming area. Suppose that's a dam?

ACDR No, that's Calgary right there.

DMP Is that Calgary?

CMP ... shot a glacier ... just west of Calgary.

CMP ... apart.

ACDR Yeah. Okay.

DMP Well, ...

ACDR ... You've got to get ...

DMP ... go through that ...

CMP Hey -

23 18 49 ACDR ... go to the right ... that.

DMP ...

DMP Okay. We're ahead of the ..., I think.

DMP ... the spacecraft.

CMP ... got it.

DMP ... Yeah, we're supposed ... that one.

23 20 13 CMP Look at that cloud down there - that dark cloud. ...

ACDR ... Yeah.

CMP You know, Deke has a ...

ACDR Yeah. I doubt that you ... changing ...

CMP Yeah.

23 21 54 CMP You got to move that - got to ...

DMP Get a chance to go down there?

23 23 27 CC-H Apollo, Houston. Hello at Bermuda. How are you doing?

23 23 33 ACDR Just super, Dick.

# # #

DAY 205

00 28 50 CC-H Apollo, Houston. We're about a minute and a half from LOS. I'll call you at Rosman at 204 plus 32. You got four good gimbal motors, trims are okay. Everything is looking fine. We'll see you after the burn.

CMP Okay. Glad to hear it's looking good.

CMP Thank you.

CC-H Okay.

CMP ... Okay. I got ... Check the ...

CMP ...

ACDR ...

00 29 38 CMP Right.

CMP ...

CMP ...

ACDR ...

00 31 07 CMP ... it up.

ACDR ... up.

CMP ...

ACDR That's ...

ACDR ...

CMP Huh?

ACDR ...

00 31 57 CMP ... second burn.

00 32 43 CMP Okay. Normal.

ACDR ...

CMP ...

CMP Jesus Christ! (Laughter)

00 33 49 CMP God. Where did all the water come from? Okay.  
...

00 34 24 CMP Okay. Got it. Yeah. Okay. Deke, you ready? ...

TIME SKIP

01 58 01 CC-H Apollo, Houston. We're 2 minutes from ATS LOS.  
DMP What - what's ...  
CC-H We'll see you at Goldstone in about 20 minutes.  
See you there.  
CMP Okay, Dick. Incidentally, we were just commenting -  
this is not - this is a sure good attitude for the  
Doppler experiment, but we kind of need a periscope  
for Earth obs.

01 58 18 CC-H Roger. FAO was sitting here thinking the same thing,  
probably.  
CMP Kawhia Island administrated by - administered by  
New Zealand and claimed by the U.S.  
DMP Is that right?  
CMP Yeah. Because it's small.  
CMP Wonder if I'll get a chance to see New Zealand again.  
DMP Probably not.  
DMP ...  
CMP No. ...  
DMP I got some apricots this morning. ...  
ACDR Okay. ...  
DMP ... call that ... because that's the ... that  
valve ...

ACDR Let it sit here - -  
CMP I can only ...  
ACDR - - until it's better.  
CMP Yeah, but it's not right.  
DMP Tom.  
ACDR Huh?  
DMP ...  
02 00 53 CMP Okay. I'm going to start ... here. ...  
CMP ... Start the ...  
CMP Start the ...  
ACDR ... 125 - 126.  
CMP Okay, on rev 126.  
02 02 28 ACDR We're right over Albuquerque, Vance. South of ...  
ACDR Was there a ...? Was there? ...  
CMP Well, there's ... looks super.  
DMP Yeah, let me take a picture of it.  
DMP ... uncorrelated.  
ACDR Well, there's one.  
DMP ...  
ACDR You got a rev 134, 35 ... area here.  
CMP ...  
ACDR Right. ...  
CMP Let's - Let's ...



ACDR I don't know.

CMP I don't know ...

DMP Okay. ...

DMP ... got through that. ...

ACDR ... set them up.

CMP Camera - the mapping camera's all yours.

ACDR ...

DMP ...

ACDR ... You got this volcano. ...

CMP Can I get that to move?

ACDR ... Maybe this one.

CMP Never have seen the Faulkland Current, have we?

02 06 05 ACDR Always been cloud cover.

DMP Anybody got a record they want to ...?

CMP No.

ACDR The other side of that country and western, that's ...

DMP ... got a better one instead of that country and western.

ACDR No. That's one of those - ... start out with a country ...

DMP ...

USA (Music)

DMP ...

CMP ... country and western ...

ACDR I don't like it.

02 07 42 CMP I don't either.

ACDR Yeah. Got some good country and western.

DMP ...

ACDR Yeah.

DMP ...

CMP That's the first one out of there.

DMP Okay. Well, well, let's see here ... one I haven't heard. ... here, that one yesterday. Let's go for rock and roll, and country western ...

CMP ...

ACDR ... rock and roll.

DMP Try that one.

CMP ...

DMP We heard that one.

ACDR ...

DMP Well there's - ... No, on the other one I ... Conway Twitty, right?

ACDR Yeah. Let me get one on. ...

DMP Vance, you know where it is?

CMP Huh?

DMP ...

CMP Yeah. It's ... down in the other one.

DMP Well, I've got ... Okay, here's ...

02 10 34      ACDR      Oh! Vance, I want you to check something before we  
                         ... tonight. I got ... clock ... - -

                 CMP      All right.

                 ACDR      Right. The clock's in the bottom of the ...

                 CMP      Yeah. But you got to make sure.

                 ACDR      ... looks like a couple ... backed off. ... backed  
                         off.

                 CMP      Where - where'd you put ...?

                 ACDR      Huh?

                 CMP      Think it was the ... in the bottom of the ... Is  
                         it down here?

                 ACDR      Yeah. You know, those twist off ...?

                 CMP      Yeah.

                 USA      (Whistling)

                 CMP      What did your - what did you hand him?

                 ACDR      Oh, what was it? Conway?

                 CMP      Yeah.

                 ACDR      No. Go ahead and play yours. ... put it ...

                 CMP      Tom.

                 USA      (Music)

                 ACDR      Huh?

                 CMP      It's okay. I wondered if - -

                 ACDR      Oh, no. I'm in this one down here. It's back this  
                         way.

                 CMP      ... coming in? See ...?

ACDR Yeah.

02 12 27 CMP Hey, you're right, by golly. See I'm giving - -

ACDR Look, one of them's backed off. That's probably ...  
... - -

CMP ...

DMP Vance, you got a ...

ACDR I think it's fully backed off.

DMP ...

ACDR ... looks like it.

CMP Yeah. Yeah. ...

ACDR ...

CMP We better tape them again tomorrow too.

02 13 14 ACDR Yeah. ... In fact, why don't you just put a piece  
of tape on each one of them.

CMP Yeah.

ACDR I think ... is fully backed off.

CMP ...

ACDR Either a ... - -

CMP ...

ACDR - - the whole thing just comes ... ... the whole  
thing just comes out.

CMP Yeah. This one is ...

DMP ...

ACDR Like what I said, if you don't bag them.

CMP Yeah. Here are ...

ACDR With this crazy arrangement ... can take a rest.  
They might want ... themselves ... all fixed ...  
Think we might get a rest after this ...?

CMP No. We didn't ... it any.

ACDR ...

CMP I don't think we'd better ... My wife wants to  
take ...

USA (Music: In the Mood by Glen Miller)

02 14 55 CMP Is that Conway Twitty?

ACDR No. No, that's not Conway Twitty. No way. I  
heard that music before you were born here, Vance.

CMP (Laughter) Oh, I remember that music very well.  
That was the music when I was in high school.

USA (Music: Sentimental Journey by Les Brown)

ACDR I remember that one.

DMP How do you like that one? Isn't that great?

ACDR Yeah.

DMP Les Brown.

ACDR Yep. Sounds of renown.

02 15 47 DMP We get anything for Farouk over Egypt down in  
there ...?

CMP Yeah.

ACDR We had two.

CMP Yeah, we had good - two good passes over Cairo.

ACDR Yeah.

DMP ... Ain't he great?

CMP Is that the book?

DMP Yeah. ...

ACDR ...

CMP Oh, I think most people like the music that - that they - you know, when they were - that they heard when they were about 16 to 25, something like that.

DMP Yeah. ...

CMP I felt that way particularly. I - I kind of like - like it all, most of it.

DMP ...

CMP I - I like modern music.

DMP I don't like that real hard rock.

ACDR No. I don't care for that, not at all.

02 16 14 DMP I like John Denver ..., Gordon Lightfoot.

CMP Only thing I don't really like - a few things, I don't like real classical things like opera, and all that kind of hog crap and - because I don't understand it; Brahms, things like that. And the other thing I don't don't like is the kind of country that you get in Nashville.

DMP Oh, yeah. That's - that's kind of - althrough some of that - that Nashville grass ... that we have ... you know some of that Nashville grass ... Couple of the ... that I ... Oh, you got a ... That looks like the - -

DMP Oh, yeah. That's - that's kind of - although some of that - that Nashville grass ... that we have ... you know some of that Nashville grass ... Couple of the ... that I ... Oh, you got a ... That looks like the - -

02 18 20 ACDR You suspect that's a cyclone?

CMP        Yeah. I'll bet from - real up high it looks just like a cyclone, kind of a - could be a - I'll bet it's that same thing we saw earlier. It looks like a possible hurricane.

ACDR        Yes. Particularly ... Take a look.

CMP        We ought to find out. ... this point, 205:56.

ACDR        All right, Vance. Take a couple of it - about 100 miles across, I think ...

CMP        Time it. ...

ACDR        It's building up on the outer edges. The whole thing narrows - weather satellite in the ... Pacific.

CMP        ...

CMP        I don't know, it appears to be a - typhoon area?

ACDR        Well, yeah. ...

02 19 07    CMP        Well, I think one thing about modern music is, that up till 10 years ago they only played about 10 percent of the classical sound. They only played all that modern guitars and stuff. All over - Well, I guess it was such a vibrating sounds of ... I think that really gives it a ...

ACDR        Here, I'll put this in the ...

DMP        ...

DMP        Which way is ...?

CMP        I don't know.

ACDR        ... Fault.

CMP        ...

ACDR        ... and cotton.

CMP        Oh, yeah.

02 20 06   ACDR    There's the Delta.

          CMP    Right.

          ACDR    ...

          CMP    ... headed towards the Fault?

          ACDR    Nope. Not yet. ... coming up.

          DMP    ... passed the ...

          ACDR    Yeah.

          ACDR    Ah, here's the coast.

          CMP    I got photographs.

          ACDR    Where is it ...?

          CMP    Oh, no. No, ... Italy, the Adriatic ...

          DMP    ...

          CMP    Yeah.

          ACDR    It's the West Coast ...

          CMP    Oh, is it?

          ACDR    ...

          CMP    Yeah. ... Must be southern California.

          ACDR    ...

02 21 33   CC-H    Apollo, Houston. AOS at Goldstone for about 4  
                  minutes, and about 2 minutes - -

02 25 04   CC-H    Apollo, Houston. I'm back up. We're about  
                  30 seconds from LOS. Give you a call at Quito in  
                  8 minutes.

02 25 10   ACDR    Okay.



ACDR      Get up there. Somebody else take this light for me.  
But don't ... hook it up ...

CMP      ... some more if you want it.

02 26 26    ACDR      No. It's all ready ... About wrapped up in the ...

CMP      Okay. ...

ACDR      I'll put this black one over here. ... that book  
... on it.

DMP      Really got a ... on 35. ...

ACDR      ...

02 27 16    ACDR      Well, let's see, what's next on the regular Flight  
Plan? ... 5, ... CMC MODE, FREE; P52 ...

DMP      Did you ever watch - notice the ones that come up  
the side?

ACDR      ...

DMP      We just haven't been in a good attitude to see.

CMP      Oh.

DMP      ... just look out there. All the - -

CMP      How about lightning? ... - -

DMP      Oh, there's a lightning ... out there, see it? It's  
going all the time.

ACDR      Yeah. I haven't seen it ... Put it - put it right  
up there ...

DMP      All together the ... time was - I'll tell you what,  
...

ACDR      Go ahead.

CMP      Together.

DMP      Together?

CMP Yeah. We may as well eat.

DMP Okay.

DMP/CMP 9:30.

ACDR Well, it's been about 5 hours since we had lunch.

CMP If we messed around much later, it - -

ACDR Deke, why don't you get over in this ... the Sun comes up, you'll be over here, okay? Get over here. Okay, ... .. get up here.

02 31 17 CMP What? Yeah. Oh yeah. Where would you like it? You too? ...

CMP Damn, somebody's getting a ... here.

DMP ... right here. ... - -

CMP Hey, Tom, while you're there could you grab the tray?

DMP - - something for this.

02 33 16 CMP Oh, you're going this way, that's right.

02 39 47 CMP I guess the first thing ... If I have a - trying to get a lot of things ...

# TIME SKIP

03 39 06 CMP Yeah. That's ...

DMP ... (Laughter)

03 41 30 CMP That - that's something ...

ACDR Okay. It was ... 07:19:28 [?].

CMP I think ... 07 ...

03 54 00 CC-H Apollo, Houston. Goldstone for 2-1/2 minutes.

CC-H Roger.

DMP Hey, Dick. You with us?

CC-H Yes, sir. Go ahead.

DMP Okay. We just saw what we think is a possible volcano. I don't know ... down there or not. ... 207:19:20 - a very large - kind of a mushroom-type thunderstorm-looking thing with a large stream of gray-brown smoke going downstream, mixed with white. ... volcano. ... horrendous oil fire. ... track that one for us?

CC-H Okay. We'll - we'll correlate that time and see if we can check it out.

03 55 26 CC-H Apollo, Houston. We're 1 minute from LOS. We're going to make this the last call of the - of the evening, so it's - we've certainly enjoyed working with you here on ASTP, and we'll see you guys when you get back to Houston. So everybody say, "Good night, Dick."

ACDR Good night, Dick.

DMP Good night, Dick.

CMP Good night, Dick.

CMP Good night, silver team.

ACDR Yeah. Thanks a lot for all your help. It was just tremendous.

CC-H We really enjoyed it. We'll see you guys when you get home. Have a nice splashdown.

03 55 55 ACDR All righty. It's been a real ball.

03 58 30 ACDR All right.

03 59 06 CMP Yeah.

03 59 24 CMP That's right.

ACDR ...

CMP Yeah.

ACDR Good. ... Looks like we got wakeup at about 8:30, then we have ... splashdown at 4:30. Then it's another 30 minutes to get onboard ... That's about an hour after splashdown; so that's 5:30. ... to 5:30. That's 4 hours ...

04 00 56 ACDR Yeah. ...

04 01 06 CMP Yeah. Oh, I'm - I've been thinking about that.

04 02 12 ACDR Yeah. Those ...

ACDR That's the only thing ...

04 04 02 ACDR You know, we ...

04 08 33 CMP Yeah. I think ...

ACDR Yeah.

04 11 42 CMP Anybody - got a screen [?] cap in their pocket? We're - This one's got a hole in here.

CMP Oh, no. That's fine. You can get it out.

CMP Yeah, I guess you'd better. Whatever you think; it's yours too, I guess.

04 12 15 CMP No. All I did was pull the loose ends in. But ...

# TIME SKIP

12 42 25 DMP Yeah, you can give me another one of those ... black ones, over there in the other one. Yeah, that's for - silver one, that's what matters ... black one. We need to dig one out of the bag over there. ... Huh? Yeah, I just brought up another bag for this stuff ... find it - -

CMP ... in the bag?

DMP Yeah. ... stick that up here, Vance.

CMP All right.  
 DMP That must have been strapped on. Oh, that goes in the IF... ..., yeah. Why don't you just ... big one up there ...  
 CMP ...  
 DMP But I think it's straight up there.  
 CMP Okay, yeah. ...  
 ACDR Well, of course, ...  
 DMP I got to - I'll give you one in a second, Tom. ...  
 12 44 19 DMP What time does it say that IF ..., Tom? Yeah.  
 DMP ...  
 DMP Yeah. Say, you strap that one over here.  
 CMP Most of that ...  
 CMP Wos.  
 DMP ... 03?  
 CMP Yeah. Should be. Let's see - -  
 DMP ... A-9 ... A-9. We're in D-105 aren't we? ...  
 CMP ...  
 DMP D-10's ...  
 CMP That's right.  
 DMP ...  
 12 47 17 CMP You got one over - far side there, Tom.  
 ACDR Yeah.  
 DMP ... back on top over there.  
 CMP You are?

DMP ...

CMP Oh, okay. See it in the corner there?

DMP ... Yeah. You got that bag full, Vance?

CMP Not yet. You got it ...

DMP I don't ...

CMP Well, wait. Why don't we have them over there?

DMP I don't know. ...

12 48 41 CMP Hey, how about a VERB 30?

DMP ...

CMP That's this thing coming up.

DMP ...

CMP Option 5.

DMP ...

CMP Yeah. But it ... where you locate it ... the first two. Tricky ... - you're on that 10-degree deadband. ...

DMP ...

12 49 55 CMP That's right. You're going to be ahead of the doctors.

DMP ...

CMP Okay. ... Guess - -

DMP Well, ... says that - -

CMP Yeah, we'll get there. Except that, well, look at this thing logically, it's much faster ...

DMP ...

12 51 30 CMP Oh yeah. Attitude, I think.

DMP        Okay. Got to do everything ... this morning. Right.

ACDR        ...

CMP        Final ... says you have to have a ... prescription  
for that ...

DMP        Okay. Tom, ...

ACDR        ...

DMP        Okay. ...

DMP        ... medication up there ..., water and ...

CMP        They - I - I had everything for supper and I had  
some ... Oh, well, ...

DMP        ... he was using that one.

12 55 21    CMP        Probably. Okay. On the - PRD ... done ... 48314.  
And tell them that the purpose of PRD onboard ...  
my hair.

DMP        ...

CMP        Whatever everybody else has got, I guess I got the  
same amount.

ACDR        ...

CMP        Yeah. I guess about 86 or something like that. I  
have a ... medium ...

DMP        ... very much.

CMP        Drinking a lot. ... Never heard that - ...

12 56 33    CMP        Odd attitude, whatever - it's not ...

CMP        Yeah, yeah. Are we - ... Yeah. Of all the ...  
Gosh. It sure takes its time, but I guess it's  
going to get there. That's - we're supposed to do  
125. That looks like ...

ACDR ...

CMP ...

CMP Got a long way to go.

13 00 38 CMP Well, Deke, like Crip said, "The party's over."

DMP Yeah.

CMP Tom's had a lot of these parties. We're on our first one.

ACDR ...

CMP Yeah. (Laughter) Yeah. ... There it goes.

ACDR Well, ...

CMP Guess that's the wrong computer. Kind of - Guess it's the attitude of - ... off of another attitude.

ACDR ...

CMP Yeah. Getting ready for ... Always thinking about that and, I guess, set out to do it.

CMP Okay. ...

13 03 10 CMP ... Now VERB 30.

ACDR ...

CMP Are we?

ACDR Well, ...

13 04 30 CC-H Apollo, Houston. We're AOS at Orroral. Have you for about 4 minutes.

CC-H Okay. If we could - down on panel 230 - get the UP TELEMETRY switch to DIRECT, please. And also, if we could have ACCEPT, we'll give you a state vector and also change our time over for PET.

13 04 49 CMP Okay. Got all those.



CC-H Could - did you get a time hack on when you started battery Bravo on CHARGE?

CMP Half hour ago.

ACDR Well, - -

CC-H At least approximate.

13 05 03 DMP - - ... stand by a sec.

13 08 46 CC-H - - your NOUN 78's for this P20 option 5. It doesn't look quite right for us here on this attitude.

CMP Okay. 78 minus ... 5.

DMP ...

CMP All right, Crip.

CC-H Those look good.

CMP Yeah, it does. Kind of looks funny to us. We can't figure it out, either.

13 09 26 CC-H No problem. We'll talk to you about it at Quito.

13 14 55 DMP Damn, things are going fast in this thing.

13 15 33 ACDR ... doctor tell you this morning.

CMP Oh, yeah.

13 32 25 ACDR Let me trade places with you, Vance, get you squared away.

CMP The message you got from ...

ACDR ...

13 36 01 ACDR I'll give you a mark. Put it on 92:59, Vance.

CMP ...

ACDR 92:59 ...

13 36 19 ACDR MARK it.

13 37 45 CC-H Apollo, Houston. We're AOS Quito for 3 minutes.  
 CMP Loud and clear.  
 DMP Okay.  
 ACDR Waste water's up, we don't have to do that. ...  
 don't have to do that. Vance, are you going to  
 shave? No, this is a good time for you to do it.  
 I'll tell you what, you better go ahead and get that  
 out of the way. ... vent. Okay, let's just wait  
 until nighttime.

13 38 15 ACDR ... Earth obs ... they have to get done today. But  
 we're a ... damn weird attitude, ... recording - ...  
 recording for Earth obs?

# TIME SKIP

14 12 49 CMP - - and - and ... 9 reads 87 ...  
 ACDR ...  
 CMP Okay. I got a fix on that ... - -

14 13 09 ACDR ... don't know the angle?  
 CMP - - stereo on that. Four shots.  
 ACDR ...  
 CMP ... 91.  
 ACDR ...  
 DMP ... recorder ...  
 ACDR Tape recorder's on.  
 CMP Should be.  
 DMP ... on here. ...

14 13 52 CMP No, no. ... another couple of minutes ...

14 14 00 CMP 0.0 ... 0.0.

14 14 24 CMP No, that's ...  
 ACDR ...  
 CC-H ...  
 ACDR Roger.  
 ACDR Okay. ...  
 14 14 54 CMP I got an ... - I got a - -

TIME SKIP

14 36 06 CMP The pass gets an update here.  
 ACDR Yeah.  
 14 36 11 CMP Houston, Apollo.  
 CC-H Okay. We're getting ready ... and going to have you  
 at ... Orroral ... go ahead.  
 CMP Crip. Do you have any updates on the times for the  
 mapping pass 135, 136?  
 CC-H Don't believe 135 is a mapping. And ... 136 ... no  
 update for them.  
 CMP Okay.  
 ACDR Do you have a ball point ...?  
 14 36 49 CC-H We're going to lose you briefly here, ... go straight  
 through. I'm going to get VHF through Orroral.  
 ACDR Okay. ...  
 CMP No, I haven't got one. You want - -  
 ACDR No, ...  
 CMP Pardon? What can I do for you?

ACDR I'll get it.

CMP I - I suspect that it's in R-3.

14 37 29 ACDR ... R-3? Oh, ... Oh, here it is - -

CMP No, wait; here it is.

CMP Okay. Here you go.

ACDR ...

14 38 01 CC-H Okay. We've handed over and we're back with you through Orroral Valley.

CMP Okay.

ACDR Yeah. ... 16.

CMP Zero. ...

CMP Roger.

ACDR And the ZFF is stowed ... per Flight Plan.

CMP Starting maneuvers to the - vis obs pass.

CC-H I'm sorry, you were - you were unreadable. Say again.

14 38 33 CMP Roger. We're starting - we are starting the maneuver to the Earth observation attitude.

DMP Yeah. ... ZFF ...

CC-H Copy.

CMP Yeah. Why don't you give me your ...?

ACDR 46.

CMP ...

ACDR ...

CMP Good. ...

ACDR Okay.

14 39 48 ACDR Houston, Apollo.

CC-H Go ahead.

ACDR Okay. On the Doppler shutdown coming up. Do you want to give us a call on that on a specific time, or do I do it just at 94 and say 12?

CMP ...

CC-H You've already started this maneuver, and that is cutting us off all our data, so you may go ahead and perform it now.

ACDR Okay. Call that out to me.

CMP Doppler?

ACDR Yeah.

CMP Panel 230. DOPPLER RECEIVER, OFF.

14 40 22 ACDR Okay. DOPPLER RECEIVER, OFF. Go.

CMP Panel 274. CB UV/DOPPLER MAIN A, OPEN.

14 40 31 ACDR OPEN. Disconnect the cables?

CMP Disconnect recorder cable; stow recorder and cable in A-6.

ACDR A-6, huh?

CMP And you're supposed to stow the tapes and reels parallel to Y-Z plane.

ACDR Okay. ...

CMP Now, I wonder why that is?

14 41 10 CC-H Apollo, Houston. We're about - about a minute from LOS and we'll see you again at Quito in 28 minutes at 94:32.

CMP Cheerio.

CMP ... the reels in this damn little bag. ...  
 ACDR Okay. ...  
 CMP We're all through with that?  
 ACDR We are through with the Doppler.  
 CMP I hope.  
 ACDR A and B works good. ... I think it is ... Doppler ...  
 14 42 12 CMP Okay.  
 ACDR Reel A, 13 plus. Reel B, 7 plus.  
 CMP Okay.  
 ACDR Reel C is 11. Reel D is 12.  
 14 42 46 ACDR Deke, how you doing?  
 CMP Yeah, I don't suppose you have to get back in ...  
 ACDR No.  
 ACDR Okay. Which way now? The axes - the rotation of the reels. The reels rotate around ...  
 CMP ... What, Y-Z plane?  
 14 43 20 ACDR Well, where do you get that?  
 CMP Don't know.  
 CMP The axes ... rotates ... That could be ... It could be handled ... way, or it could be done like that. Right? Which way ... - -  
 14 43 32 ACDR Y - - ...  
 CMP - - like this?  
 ACDR No, like - like this.  
 CMP Towards this plane. ...

ACDR      Okay. Y - no, this plane is up.

CMP      Oh ...

ACDR      You got a ...

ACDR      Here's - here's Z.

CMP      Z.

14 43 48      ACDR      Here's Y.

CMP      Okay.

ACDR      So they have to stay parallel to that plane. So  
we - -

CMP      No, not - -

ACDR      Here you go.

CMP      Yeah? Okay.

ACDR      It's got to be like that.

CMP      Okay.

14 44 08      DMP      Okay. Junk. ...

ACDR      No, we don't have to stow it.

DMP      Think I ought to put my Velcro strap around ...?

CMP      I don't know.

DMP      Got some tape, though.

CMP      Got some tape. ... anyone find the tape?

DMP      ...

14 44 36      ACDR      (Laughter) We got to put this in A-6. The Doppler  
is shut down. ...

ACDR      Huh?

DMP      ...

ACDR Yeah. I was wondering what happened to it.

ACDR Yeah. Got to go on its side ...

CMP And here's the - cable 30.

DMP Okay. ...

14 45 30 ACDR Okay. Let me show you how it has to go - it has to go - Okay. I'll do that ... Got to go like this. Goes like this.

CMP Everybody else get the tape? I'll ... out of the ...

ACDR First ... Huh?

ACDR That's - that's ... the cable. ... for the cable. Cable is ...

ACDR ...

CMP Yeah?

DMP Oh, the cable doesn't matter.

CMP Let's go.

14 46 48 CMP Maybe we only should carry one of them down there.

ACDR Yeah.

CMP ...

ACDR Okay. Let's ... the Flight Plan?

ACDR ... I think I can ...

14 47 23 ACDR Vance, I think we ...

CMP Yeah.

ACDR Nearly in.

CMP Okay. Now.

ACDR Same thing as you did for the Doppler ... ..



CMP Oh - well, but - Yeah. I don't have - a - Yeah. I  
 got to find a home for it, somewhere.

14 47 48 ACDR Yeah.

CMP ...

CMP Hey, you're getting pretty close to your vis obs  
 pass. They have pitch 15 and yaw 322.

ACDR Okay. Pitch 15 and yaw ...

ACDR plus 15?

CMP Yeah.

14 48 30 CMP Deke?

DMP Yeah?

CMP Did you stow that - Doppler recorder - -

DMP Yeah. Yeah.

CMP - - right place? Okay.

ACDR 3 what? 22?

CMP Yeah.

CMP Yeah.

14 49 09 CMP Visual obs, next thing.

ACDR Yeah, that's ... The next thing, CM height measure-  
 ments. That's it. ... sunlight. I'm going to get  
 another roll of film; this film is about out ... We  
 got ... Let's see, ... 15's ... Oh hell, we got  
 the whole thing for Earth obs all through.

CMP Yeah. ...?

ACDR ... 8.

14 50 04 CMP Yeah. Right here.

ACDR ... 5, 7.

CMP Yeah.  
 ACDR ...  
 CMP Yeah.  
 ACDR ... have one of these.  
 CMP Yeah.  
 ACDR ... get filled out?  
 14 51 02 CMP Deke, you want your picture taken now?  
 ACDR I about fixed him. (Laughter)  
 CMP He didn't do it to me. I won't do it to you.  
 ACDR (Laughter)  
 14 51 15 ACDR Nikon film out of here. ... that Nikon real fast ...  
 the whole role back on. In fact, we got color  
 exterior. ... we have one roll of color exterior.  
 Put that ASA 64 in, will you?  
 CMP ...  
 ACDR ... it right up.  
 CMP ... move over.  
 ACDR ... We aren't going to come back through here.  
 14 51 52 ACDR You know, ... we had that thing ...  
 CMP Yeah.  
 14 53 03 CMP Yeah. Hey, why don't you get that cue card. Grab  
 that cue card, Tom, I got my ...  
 ACDR Okay.  
 CMP ... 250 ... f/8 ... About one and a stop - stop  
 and a half ...  
 14 53 33 ACDR Now - now, now wait. You've got the same lens, the  
 same 50-millimeter lens ... The only thing to do  
 is ...

CMP Yeah. But - but all our Earth obs book stuff, it was 250.

ACDR Yeah. But 50 ...

14 53 52 CMP Okay; well, what've we been using with the black camera anyway?

ACDR ... same thing ... 50 ...

CMP ...

ACDR Yeah. But there is a difference. The 50 ...

CMP 50 ...

14 54 07 ACDR Yeah. Right.

CMP Yeah. And that's a stop and a half?

ACDR Yeah.

CMP Okay. ... ready ... to go?

ACDR Yeah. ...

14 54 50 CMP And it's daylight. Oh, boy.

ACDR ... I don't either. ...

CMP ...

ACDR Okay. ...

14 56 24 CMP Okay. We got ... set up. First one is 7-F.

ACDR ...

ACDR ... Nikon ...

CMP ... I'll take it over here ...

14 56 59 ACDR Okay, get - get the Nikon all set for ...

CMP The Nikon's ready to go.

ACDR Got to reset that ASA on the ...

CMP 64 ...

ACDR ... Yeah. Okay. We're all set for the attitude.

14 57 13 CMP Okay; would you like the ... or the black? You can have either one.

ACDR ...

CMP Okay.

ACDR First thing we're going to come across is the Galapagos. ... That whole - that whole thing ...

ACDR ... time line? ... We go from 94:20 to 95:10. We got about ... The whole thing ...

CMP ... Boy, they sure crammed it.

ACDR Yeah.

CMP ...

14 57 52 CMP You know, a thought too - might be to take - take a little Nikon shot out the window, exterior color ...

ACDR Yeah. That's a great idea. What we could do is take that ... down in the bottom of the ... it out.

CMP This color film? Is that - -

ACDR Yeah. Color - color of the water.

14 58 21 ACDR Okay. Recorder's all set.

ACDR I'm trying to pick up the ...

CMP Okay. ...

14 58 45 ACDR Started at 7F at 94:30. ... the Galapagos Islands. ... water.

CMP ...?

ACDR Huh?

DMP Hey, look. ... those clouds ...

DMP ... to figure out what it is.

14 59 27 CMP Hey, look at the ocean ... quite awhile here.

CMP Okay. I just put my pen down.

14 59 54 ACDR Yeah. We don't really get started till about ... 30. ...

CMP Okay.

ACDR ...

CMP Yeah.

DMP ... camera, here ...

CMP ...

DMP ...

15 00 37 CMP Well, also, you got to start getting rid of those films ... A-6 ...

ACDR All that stuff - -

CMP Oh, A-6, you said, is full.

ACDR Yeah. What we got to do; we got to take ...

15 00 52 CMP Maybe we ought to just put it in ... right?

ACDR Okay. I asked ...

CMP Yeah, we're ... I think, Deka.

DMP ...

15 01 07 CMP I - well, yesterday we came on a Flight Plan place that said, basically, stow the film. And they had us putting it in ... 3 - -

ACDR Yeah.

CMP - - and A-5 ... there's no way ...

ACDR ...

CMP Thing is, we can't have'em fall down on us during flight.

15 01 30 ACDR Yeah. I think, Vance, ... stow a bunch of that film in those ... and that's about it.

CMP I think it's - -

ACDR ... TSB bags.

CMP That's the way to do it.

ACDR ... you're worried about those cables popping open - -

CMP Well - -

15 01 43 ACDR ... stuck way back there in the ... 15 minutes. ...

15 01 53 CMP Okay, I'm going to try to - ...

CMP What about ... Is that full?

ACDR No, A-3 ... put it all ... A-3 ... Let's stick it all in A-3. Everything ... in A-3.

CMP All right.

15 02 23 ACDR ... stowed in A-3, and then after you get all that stuff in there and ... the rest ...

ACDR Speaker box 164, 165.

15 03 00 DMP Kind of like Soyuz; can't stow nothing to start with ...

ACDR You know, there's a ... on the ... on the outside area, out of plane ...

DMP Yeah, I know. ... looks at the angles here.

15 03 32 CMP Okay. The - Hasselblad already's in A-3.

ACDR ... everything. Everything in A-3 ...

CMP Okay.

ACDR Put all the rest of that stuff up against ... down there. ...

CMP Yeah. ... one ... over there.  
 ACDR Yeah. ...  
 15 04 04 DMP Okay.  
 DMP Okay, I'm supposed to put - Hey, I'm going to put  
 this God damn light thing back here with the - -  
 CMP Okay.  
 DMP - - 35-millimeter ...  
 CMP Be nice to put it all together.  
 15 04 53 CMP ... Maybe I can take a couple ...  
 DMP ... here. ...  
 15 06 00 CMP Okay. Can I hold that till we ... - have to ...  
 DMP ... all we got.  
 CMP Is that it?  
 DMP Yeah.  
 CMP ... because that wasn't any problem.  
 15 06 10 DMP Well, just one little ... but that's ... I'll give  
 you this bag ... That's ... Okay. ... stuff.  
 CMP I get real surprised how we fit this stuff - -  
 DMP ...  
 CMP - - ... space ...  
 ACDR There's really no difference ... In fact, that's ...  
 CMP Okay.  
 DMP Okay. The ... angles ...  
 ACDR Yeah. ...  
 DMP Can have what?

ACDR ... about ...

15 07 08 DMP Oh, okay. Okay. Then we got ... put them away.

ACDR That's all.

DMP That's it. ...

ACDR Yeah.

DMP ... the DAP.

ACDR Yeah.

DMP ...

ACDR I think we got her locked.

CMP All right.

DMP Yeah. We're okay.

15 07 26 ACDR We could really go ahead and tie down those ... Why don't you come on up - start this DAP - Yeah, why don't you come on up, Vance. Let's get - -

DMP ... we already - we got this thing ...

ACDR What we got to do now is ... attitude. Have to see if we're ready to come home.

CMP Okay.

15 07 51 ACDR ... must be 5-1/2 hours to retrofire ...

CMP Yeah.

ACDR ... got an ASA in 6 to go on that?

CMP Yeah. ...

ACDR ... got to ...

CMP ... No, that's about right.

ACDR ... okay?

CMP Yeah.



15 08 10 DMP ... got the ...  
 ACDR Yeah. I'll ...  
 DMP ... big cloud pattern down there.  
 ACDR Yeah. ...  
 DMP ... around the ... Big cloud here, down to the left.  
 ACDR Down here on the left?  
 DMP Yeah. You can see it to your left.  
 ACDR Oh.  
 CMP My left.  
 ACDR Right.  
 DMP See that ... around that island? ... Look, there's another big ... another ...

15 08 47 ACDR Oh, hell! That's the Galapagos. That's what I'm supposed to be shooting! (Laughter)

CMP ...  
 MS ...  
 CMP Look at that, down there.  
 CMP Better with the wide angle.  
 ACDR Oh, hell; look at those things. ...

15 09 43 ACDR Okay. We've got the Galapagos Islands. Got stereos. ... clouds around ... the volcano ... through the cloud cover - -

TIME SKIP

16 04 37     ACDR     Okay, Crip. Thank you. We're progressing normally here, I think.

              CC-H     Very good. Somewhere during the next ATS pass ...

16 05 31     DMP     Here it is. B-6.

              ACDR     What?

              DMP     B-6.

              ACDR     Yeah.

              DMP     ...

16 07 28     DMP     Yep. Has anybody seen the filter for the data pass, Tom? The orange filter? I don't have it.

              ACDR     The orange filter for the ... data pass?

              DMP     Yeah.

              ACDR     Have you seen the orange filter for the ... data pass?

              CMP     I haven't seen it.

              DMP     Son of a bitch!

              CMP     Is that the orange filter for ...?

              DMP     Yeah. ... pass.

              ACDR     Oh, Vance has ...

              CMP     Could be. Maybe I forgot, and I stowed it.

              DMP     It's not there, Vance, so somebody has stowed it.

              CMP     Maybe I did stow it. What the hell did I stow, that I thought I stowed that? (Laughter) The only thing that I can think of is ... What did I stow? I stowed something there this morning that I thought was ... Maybe that was it. Probably put it in 6. I stowed the ... I don't know where. I think in B-6. Okay; the ... in B-6. ...

16 10 04     DMP     ...

DMP Okay; thank you.

CMP Okay; 11:33.

DMP Okay; we've got 2, 3 ...

CMP That's it, huh? All she wrote?

ACDR Yeah.

CMP ... filter?

ACDR Yeah, the filter is ...

16 12 32 ACDR ... camera there. Silver camera ...

ACDR Well, we counted five on the other one.

ACDR Yeah. That's all - that's all we got left. You going to bag that too? ... filter.

CMP Which do you want me to do?

ACDR ... Try another one.

CMP Yeah.

ACDR ... get them all out here and get some ...

ACDR ... Okay; let's put this filter over here. Okay; let's get them in order.

16 13 51 DMP Let me get to the filter bag.

DMP I'm going to get the orange filter for that lens. I've got the wrong filter. Let me get the right one. Wrong lens ...

CMP Here's the ...

DMP Thank you.

CMP All right.

DMP ... That's it. That's it in the ...

CMP Is that the box?

DMP It's inside one of these other boxes. ... on the side of the box.

CMP ...?

16 15 48 DMP Hey, I know what happened to that lens. I - I put the filter down here in that bag with the - the lens too. And I put a filter - put it down in the bungee bag, and when the lens that came with it ... somebody else in A-6. That where .. put it. Somebody saw it and put it back up here. That's what happened. (Laughter)

CMP ... bag?

DMP I don't have any idea. All I remember is ...

DMP Yeah. ... A-6. ...

16 17 39 ACDR Any time you're ready, ...

CMP Yeah. We got to get the ILH - LiOH.

CMP ...

16 19 15 CMP Now, that - other bag. Still looking for it, I guess.

ACDR What bag?

CMP And where will it be?

DMP ... up.

CMP Okay.

ACDR ...

CMP Yeah. ...

ACDR ...

CMP Yup.

ACDR ...

16 20 13 DMP Okay. Stick tape on it, Tom. ... corner of A-6, there. Was anything taken out of A-6?

DMP Okay, that ...

16 21 14 CMP I'll go, Deke. Want to hand me - -

DMP Put it right in the front corner there.

CMP ...

DMP ...

16 21 25 CMP Very good. ... I don't know ...

16 21 41 CMP I don't know ... Well, ... get in position here ... Okay.

DMP Okay. ...

CMP Okay.

ACDR ...

16 23 24 DMP We got 42 left on the Nikon, Tom.

16 23 32 CMP Well - I don't know. Maybe ...

DMP 09 is black.

16 24 07 DMP Okay. ... Okay, ...

16 25 17 CMP Okay. All right. First, the top of the head, right?

16 28 30 CMP Yeah, it helps.

CMP Did you find it?

ACDR Okay. ... for the ...

CMP ... haven't tried ...

16 32 52 CMP Yeah. Yeah, the bag is ...

CMP Yeah. ... That's all.

CMP Oh, did you? No, all I did was - I should have, I guess.

DMP ...

CMP Here it is.

DMP ... tape recorder ...

CMP Well, next one ... mapping pass.

16 34 59 DMP Okay; coming up with ... revolutions 135 and 136.  
...

CMP Okay.

DMP ... orange filter ...

CMP Yeah.

DMP It could be that ...

16 37 33 CMP Okay, Deke. Thank you.

DMP ...

DMP Hey, we've got an attitude in here now.

CMP Yeah.

DMP Where is it?

CMP ...

16 38 12 DMP Oh, I know what's going on. ... we go down from that. I'm looking at ...

16 42 21 ACDR ... over.

16 42 47 CMP Yeah. ...

ACDR ... the Gulf.

DMP Okay. ... .. water.

16 45 10 CMP See those clouds there? They almost follow the coastline. That's why the clouds come out in front ...

DMP ...

CMP ... clouds line up on the ...

16 45 32 CC-H Apollo, Houston. We're AOS through MILA. I've got you for 6 minutes.

16 45 35 ACDR Okay.

16 53 13 DMP And we just crossed good ole Boothbay again, and, as usual, it's under clouds here from our angle. Got some beautiful pictures, however, of the Cape Cod area.

CC-H Very good.

DMP And we did get some color prints, or measurements, between the - New Orleans and Mobile there.

16 53 32 CC-H Great.

16 53 33 DMP Get ... bit.

# TIME SKIP

18 17 07 CC-H Good deal. We're all - we're all squared away now. One item, I guess, we need for - for entry - post-flight photos is verification that we did get our ZFF taken on time - that last one.

18 17 22 CMP Verification of what?

ACDR Say again?

CC-H - - get the ZFF photos, our favorite fungi, taken back there at about - oh, 93:50 on the PET.

18 17 32 ACDR It was on time.

CC-H Okay, fine. Thank you.

ACDR As usual, Crip, as usual.

CC-H Oh, Roger. Didn't expect any difference. We're going over the hill; we'll see you at Newfoundland in about 7 minutes.

18 17 44     ACDR     Okay. And I got the pyro battery check at Madrid.  
Thank you.

              CC-H     Roger.

              ACDR     Okay. ...

              CMP     Hey, Deke. The yellow ... K-cable [?] bag. Did we  
get rid of that?

18 18 19     ACDR     He stuck it up in the docking module for a while. I  
think it's in the big cable bag, isn't it? K-cable  
610?

              CMP     Okay. Well, we were supposed to disable the DAC.  
Okay. Never mind. I was just wondering if - -

18 18 39     ACDR     But the cable came back.

              CMP     Yeah. Okay. It's the bag I was wondering about.  
Okay. No sweat.

              CMP     That was a good one.

18 19 07     CMP     ... .. attitude ... off nominal ... .. to turn  
of the radiator ...

              DMP     Well, we got stars to ... .. pyro batteries check  
coming up.

18 20 15     ACDR     Always try to remember the Skylab Flight Plan is  
time loaded for individual ... pitch and roll ...

              CMP     During entry, or what?

              ACDR     Well, no, I just ...

18 20 30     CMP     Oh. I think they - they got everything packed and  
ready to go before they ever undocked from Skylab.

              ACDR     Yeah.

              CMP     They - ...

18 21 24     CMP     Okay. We've packed.

              ACDR     Okay.



CMP Little baby, where are you?  
 18 21 53 ACDR Huh? Yeah. ...  
 18 23 06 CMP Is there a box of Kleenex still around up there  
 someplace?  
 ACDR Yeah.  
 ACDR ...  
 18 24 19 ACDR What? ...  
 CMP When you were talking about putting on the ... tape  
 ...  
 ACDR Yeah.  
 CMP I just - I did not ... I don't know - maybe it was  
 ...  
 18 24 51 CMP No.  
 CMP Got your ...?  
 CMP There are a lot of them in that ...  
 18 25 23 CMP Oh, here they are. Just came flying by.  
 CMP This rubber cushion. Got it in backwards here.  
 ACDR Yeah. ...  
 CMP Okay.  
 18 26 16 CC-H Apollo, Houston. We're AOS Newfoundland, and with  
 the ATS, we should have you about 50 minutes.  
 ACDR Roger. Okay. ...  
 CMP Oh. How about a VERB 30?  
 ACDR I ... got it right here.  
 18 26 32 CMP Oh. Oh, I see. You want it put in. Okay.  
 ACDR Minus 25 and yaw 4.

CMP Okay.  
 18 27 10 CMP Okay. ... see, yaw 4.  
 ACDR Pitch 5, yaw ...  
 CMP How do you read on that, ...?  
 ACDR They don't ...  
 CMP No. It's time to lock up.  
 ACDR ...  
 18 28 25 ACDR Hello, Houston, Apollo. How do you read? Flight Plan says ...  
 18 28 36 CMP All right. ...

TIME SKIP

19 14 14 DMP Houston's ... right down the ...  
 19 14 18 CC-H ... we're going to have - -  
 19 14 19 ACDR MARK.  
 19 14 20 CC-H - - have Orroral in about 3 minutes - -  
 19 14 23 ACDR You look out, and you'll see a retrofire pattern right now. Vance? You look out and you'll see a retrofire pattern right now. Is it on?  
 19 14 35 CMP Yeah. ...?  
 19 14 45 ACDR One ... and one ...  
 19 14 47 CMP Okay.  
 19 14 49 ACDR That's right, if you have a down time of - -  
 19 14 52 CMP Yeah.  
 19 14 57 CMP I suppose you can take this ... book ...  
 19 15 01 ACDR Put it - I'll get it squared away later on.  
 19 15 06 CMP Okay.

19 15 08 ACDR The only thing left is - -

19 15 10 CMP Is this yours, Deke?

19 15 18 ACDR I don't know. Hell, I don't know; we'll get it later.  
No, I've got one, that's yours, Deke.

19 15 34 CMP Okay, ready for the EMS check.

19 15 36 ACDR We'll dress and we'll get our boots on later.

19 15 42 ACDR ... down in good shape?

19 15 49 CMP Well, I guess we might as well have ... out.

19 15 51 ACDR All right. We'll do it.

19 15 53 CMP ... Okay.

19 15 56 ACDR Okay. EMS FUNCTION, OFF.

19 15 58 CMP OFF.

19 15 59 ACDR Circuit breakers, two, EMS, CLOSE; panel 8.

19 16 01 CMP CLOSED.

19 16 03 ACDR EMS moni - MODE, STANDBY.

19 16 06 CMP STANDBY.

19 16 07 ACDR EMS FUNCTION, EMS TEST 1; wait 5 seconds.

19 16 11 CMP Okay.

19 16 20 ACDR Okay. Okay, EMS MODE, NORMAL; wait 10 seconds.

19 16 44 CMP Okay.

19 16 45 ACDR Got it?

19 16 46 CMP Yeah.

19 16 47 ACDR Okay. Slew hairline over notch in self-test pattern.

19 16 51 CMP Okay.

19 16 59 ACDR EMS TEST 2. .05 G light on, all others out.  
 19 17 06 CMP Okay. Verified.  
 19 17 13 ACDR Okay. Wait 10 seconds.  
 19 17 24 ACDR EMS FUNCTION, EMS 3.  
 19 17 27 CMP Okay, I'm in mode 3.  
 19 17 29 ACDR .05 G light on; RSI light lower on, 10 seconds later.  
 Stand by to PRO -  
 19 17 34 ACDR MARK it. Okay. RSI lower light on, 10 seconds later.  
 19 17 44 CMP MARK.  
 19 17 45 ACDR Okay. Okay, is the RSI light on? Okay, then set  
 range counter to 58.0.  
 19 18 07 ACDR Plus or minus ..., okay? EMS FUNCTION, TEST 4.  
 19 18 11 CMP Okay. Go ahead.  
 19 18 12 ACDR .05 G light on; G-V trace's in the lower right-hand  
 corner. Range counts down.  
 19 18 18 CMP Counts down.  
 19 18 19 CC-H Apollo, Houston. We're with you on VHF through  
 Orroral.  
 19 18 25 CMP Roger. Understand.  
 19 18 28 CC-H Rog. Don't anticipate too good a comm this time,  
 and we'll have you at Vanguard in about 3 minutes.  
 19 18 34 CMP Okay.  
 19 18 35 ACDR Okay.  
 19 18 36 CMP Okay. ...  
 19 18 49 ACDR ...  
 19 19 00 ACDR RSI upper light on, 10 seconds later.  
 19 19 04 CMP Okay, and it's supposed to come to 9 g's, right?

19 19 06 ACDR That's right.

19 19 09 CMP MARK. Okay.

19 19 16 ACDR RSI upper light on, 10 seconds later, and I've got ...  
on. Got it? Range indicator 0.0. Scribe traces  
vertical line 9 g ... 0.28 plus or minus - -

19 19 29 CMP Wait.

19 19 33 ACDR Got it?

19 19 34 CMP Okay.

19 19 35 ACDR Set EMS scroll to 37K.

19 19 39 CMP Stand by for just a second. Houston, Apollo.

19 19 45 CC-H Go ahead, Vance.

19 19 47 CMP EMS checks out good for entry.

19 19 50 CC-H Very good.

19 19 51 CMP Except we haven't checked it for burn ...

19 20 11 CMP Okay. And what is it, 38?

# TIME SKIP

19 28 48 ACDR Why don't you give me the equipment checks?

19 28 50 CMP ...

19 28 52 ACDR Well, we got a - you're going to have to - you've  
got 9 or 10 minutes to retrofire, so you'd probably  
better - start that. What you got next on it?

19 29 19 CMP Not much, but you're going to - I'll read you some-  
thing down the line.

19 29 23 ACDR All right. Let's see - -

19 29 25 DMP ...

19 29 26 CMP Huh?

19 29 27 DMP ...?

19 29 28 ACDR Yeah.

19 29 29 CMP Yeah.

19 29 30 ACDR Yeah.

19 29 32 CMP One more.

19 29 44 DMP ...

19 29 45 ACDR ... want a - projectile up there. Now. Here it is.  
Yeah.

19 30 20 ACDR Vance, you want to - you ready for your stuff, your  
heel things?

19 30 23 CMP Yeah.

19 30 24 ACDR I'll put - I'll put them on for you while you're  
getting that other checklist.

19 30 28 CMP Okay. Let me just check again. I'd like to check  
them over.

19 31 01 CMP Okay. Your DAC's all set up.

19 31 02 ACDR ... turn on the cabin fan.

19 31 06 DMP It's on.

19 31 18 ACDR Let's get this mother as soon as possible.

19 31 28 CMP Okay. Final stowage list. Have you got ORDEAL?

19 31 31 ACDR That's stowed, locked away, and turned off; and both  
balls are INERTIAL.

19 31 34 CMP Now's when I have to get down - GLYCOL TO RAD SEC  
valve, BYPASS. On panel 377. Yeah.

19 31 51 ACDR It's stowed right - it's stowed right there on the -  
down by the ...

19 31 54 CMP Okay.

19 35 05 CMP Okay.

19 35 26 CMP Verified except for one that I have to go.

19 35 49 CMP It's very quiet - been 20 minutes.

19 36 09 CMP Okay. R - CM RCS HEATERS are OFF. CM RCS LOGIC is OFF. CM RCS HEATERS, secured. RCS activation in 20 minutes.

19 36 27 ACDR Do you know what we forgot to do?

19 36 29 CMP What?

19 36 30 ACDR Sign the Goddard book.

19 36 31 CMP (Laughing) We'd better do that, huh?

19 36 38 ACDR Yeah, there's something in the middle of the Flight Plan ...

19 36 54 CMP Okay. Get that bag and tie that down.

19 38 27 ACDR ...? ...

19 39 10 CMP Boy, that's a really a nominal entry. When they gave us that last burn, they really - gave us a good - good burn.

19 39 20 ACDR Yep. You got a ballpoint, Deke? It's right on the left. I guess just the title page will do, huh? ... these - -

19 39 42 CMP Hell, I've signed it, haven't I?

19 39 43 ACDR - - we've all signed it but you.

19 40 52 ACDR How're you doing?

19 40 53 CMP Good.

19 41 16 DMP Let me look around in this hatch and make sure we don't have something floating loose. Toothpaste!

19 41 22 ACDR The tunnel is clear. Yeah, I may or might - may not get my teeth brushed. (Laughing)

19 41 32 CMP Might be on TV.

19 41 33 ACDR I know I'm not, because I lost my toothbrush. ...  
decision.

19 41 44 DMP Okay. I'm going to reel the tape recorder back in  
here.

19 41 48 CMP That should be a good spot, Tom.

19 41 50 DMP Did you take the tape out of that thing? We didn't.

19 42 00 ACDR No.

19 42 01 DMP Well - -

19 42 02 ACDR No, no.

19 42 03 DMP We'll get it. Okay, this God damn gift bag is  
pretty much floating but I don't guess it'll - -

19 42 18 ACDR ...

19 42 19 DMP - - hurt anything.

19 42 20 ACDR Maybe I can take it and stick it under the - the ...

19 42 24 DMP Well, the problem is to get down your little strut,  
as a matter of fact.

19 42 27 ACDR Yeah.

19 42 28 DMP Hold on to this, and I'll do it.

19 42 30 ACDR Here's another projectile. Got it.

19 42 42 DMP ...

19 42 59 DMP ...

19 43 02 ACDR ...

19 43 12 ACDR ...

19 43 16 DMP Yeah, ... going to do with this box.

19 43 21 ACDR Where is our gift bag at? Oh, there she is ...



19 43 25 DMP ...

19 43 26 ACDR Okay. Got any other ...?

19 43 32 DMP ... I'm going to shitcan this watch now.

19 44 07 ACDR Okay. 29:06.

19 44 11 CMP Yep. ... ..

19 44 35 ACDR Do you got ... on it yet?

19 44 54 CMP Okay, try it over here.

19 45 04 ACDR This is our entry pad? The preliminary - the final?

19 45 06 CMP Yeah.

19 45 07 ACDR Okay; we'll copy that stuff down on it. Did you check P- P30 this morning? P30?

19 45 19 CMP Too early. There's no point in doing it ... The next thing is activate the CM RCS.

19 45 48 ACDR You going to get us the updates, the final updates?

19 45 54 CMP Did that.

19 45 56 ACDR I mean as far as the STDN update?

19 45 58 CMP Yeah. Yeah, they'll update.

19 46 08 CMP They've got a chance to change their mind on that final pad Crip read up, Crip said.

19 46 37 DMP Listen.

19 46 38 ACDR Yeah, sure, Deke.

19 46 45 DMP Okay, coming up the California coastline here.

19 46 49 CMP One more rev. Okay, what part of California?

19 46 54 DMP Don't know. I'm not sure.

19 46 58 CMP San - what do you call it - Valley.

19 47 07   ACDR   Stick it in the bottom.  
 19 47 09   CMP   Throw it away. Anybody else want some?  
 19 47 12   ACDR   No, thanks.  
 19 47 13   CMP   That goes for the toothbrush, too.  
 19 47 23   DMP   Oh, there's the Salton Sea down there. We're right  
           up above San Francisco, must be.  
 19 47 28   CMP   Yeah. San Joaquin, that's what - -  
 19 47 31   DMP   Yeah.  
 19 47 32   CC-H   Apollo, Houston. We're AOS Goldstone - 4 minutes.  
 19 47 35   CMP   Roger, Crip. Coming right up over the San Joaquin  
           Valley. Loud and clear.  
 19 47 41   ACDR   Simulator.  
 19 47 43   CMP   Yep.  
 19 47 44   ACDR   RET 0.2 g, 27:51.  
  
 19 51 02   ACDR   Down range error, minus 444.7.  
 19 51 35   ACDR   We don't have the cross range yet.  
 19 51 43   CMP   Good.  
 19 51 51   ACDR   The basic bank angle is 307/051.  
 19 52 01   CMP   Our splashdown point, I thought, would be 200 west  
           of Oahu. Now it's 400.  
 19 52 14   ACDR   307/051. RET reverse bank is 33:42. RET DROG, 36:27.  
           RET MAIN is 37:14. Okay, it's all written down in  
           big letters.  
 19 52 38   CMP   Okay, thanks.  
 19 52 41   ACDR   Got that? Okay, we - did you set the angles, Deke,  
           for the satellite?

19 52 49 DMP Yeah.

19 52 51 ACDR They're in there.

19 52 57 CMP Got about 10 minutes here - 5 - do anything - Make a last phone call.

19 53 03 ACDR Myrtle call? That's a good idea. ...?

19 53 12 CMP Yeah. ...

19 53 18 ACDR I guess we turn Myrtle off, don't we?

19 53 20 CMP Yeah.

19 53 22 DMP ... tricky. I left it vent in there.

19 53 24 CMP Waste stowage vent, might as well close that, too. Make sure it's closed. It is now.

19 54 37 ACDR Let me use it as soon as you're finished with it, Vance.

19 54 39 CMP Okay.

19 54 40 ACDR Got to ... around here for one last go.

19 54 42 CMP You got it.

19 54 47 ACDR Final check around. Vance, I think I'm around your -

19 55 00 CMP Sorry about that. You have to come down, no, go over it. ...

19 55 06 ACDR ...

19 55 21 ACDR You want to use Myrtle one last time, Deke?

19 55 23 DMP Might as well, whenever you're through. Then I'll flush it.

19 55 26 ACDR Okay, and then - Oh, we don't need to flush it, we just - -

19 55 29 DMP Well, ... - -

19 55 30 ACDR - - just turn the - the - the dump off. You know, ... off.

19 55 35 DMP ...

19 56 28 ACDR Okay, all we got to do is this - battery's in VENT. Let's repeat: all we got to do is - Deke, after you use it, is go to - -

19 56 36 DMP Go to VENT.

19 56 38 ACDR - - to VENT.

19 56 39 CMP Let's see, on - -

19 56 40 ACDR I'll get it.

19 56 42 CMP - - I wonder if we're supposed to have - I guess it doesn't much matter if we have the battery vent when we land - never thought about it.

19 56 48 ACDR Well, we could shut the battery vent, too - shut both the ... - -

19 56 51 CMP Yeah. Why not.

19 56 52 ACDR - - ... screw up the telescope. ...

19 56 53 CMP Expect we do.

19 56 54 DMP Okay, we're in position, we want to shoot six frames here, right?

19 56 59 ACDR Yeah, that'll - that'll give - six frames will get you a pretty damn good picture. ...

19 57 10 DMP That'll do her.

19 57 11 CMP Going to have to probably kind of keep an eye on her, huh?

19 57 15 DMP Yeah. No, here's what I'll do. Whenever I see anything that looks like it ... is turn it off. And then I'll wait until late in the game to ...

19 57 25 ACDR Yep.

19 57 27 CMP Okay, I'm going to read over some of these rules here, Tom.

19 57 29 ACDR All right, let's do it. ...

19 57 31 CMP Take over during the burn. 5 degrees - 5 degrees  
a second. Cutoff burn time, plus 1 second. If  
you don't make the time, we burn 90 seconds late or  
11 feet per second underburn - -

19 57 41 ACDR Don't ...

19 57 42 CMP - - ... overburn and still make the target. Down  
range error check should be valid - if trim residuals  
are greater than 0.2 - ...

19 58 04 ACDR It's 40 minutes.

19 58 06 CMP Okay, this is what we should have had them change.

19 58 27 CMP Okay. Tom, let me show you this completion chart.

19 58 29 ACDR All right.

19 58 38 CMP It says - 191.

19 58 42 ACDR Okay.

19 58 43 CMP RCS capability.

19 58 44 ACDR All right.

19 58 46 CMP Let's check it. If no ignition - ignition or T-to-go  
is greater than 169, go around - -

19 58 49 ACDR Yeah.

19 58 50 CMP - - if <sup>the</sup> less than - -

19 58 51 ACDR 169, complete.

19 58 54 CMP - - complete. Here's the line. In other words, if  
it's on this side, we go around, on this side, we -

19 59 04 ACDR Here?

19 59 05 CMP Yeah. Back here.

TIME SKIP

20 32 02 ACDR - - 0.2 in pitch, 8 in yaw.  
 20 32 04 CMP Okay.  
 20 32 05 ACDR Check the MTVC.  
 20 32 07 CMP Okay, clockwise?  
 20 32 08 ACDR Clockwise, no MTVC. PITCH 2 on and YAW 2 on.  
 20 32 14 CMP PITCH 2 on -  
 20 32 15 CMP MARK.  
 20 32 16 ACDR That's good.  
 20 32 18 CMP YAW 2 on -  
 20 32 19 CMP MARK.  
 20 32 20 ACDR Set trim.  
 20 32 21 DMP ... predictable.  
 20 32 22 CMP Good.  
 20 32 24 ACDR SPACECRAFT CONTROL, CMC. Check MTVC, we got it.  
 Neutral. No MTVC.  
 20 32 33 CMP No MTVC.  
 20 32 34 ACDR GPI returns to zero.  
 20 32 36 CMP Rog. Go ahead. AC/DC?  
 20 32 41 ACDR Hold it. Well - Well, wait. Oh, I'm sorry. Okay,  
 you're - you're way ahead of me; that's good. Okay.  
 20 32 45 CMP I'm sorry.  
 20 32 46 ACDR No problem. Okay, AC/DC. You got BMAGs, three to  
 RATE 2.  
 20 32 50 CMP Rog.

20 32 53 ACDR Okay, you ready?

20 32 54 CMP Trim.

20 32 55 ACDR PRO. That put the ERROR light on.

20 33 01 CMP Get that circuit off ...

20 33 04 ACDR Right there, where you're pointing it; 204.

20 33 07 CMP ATT 1, RATE 2.

20 33 09 ACDR Sounds good.

20 33 12 CMP ... there. Okay. Let her - let her rip.

20 33 15 ACDR Proceed. ... checking around back there.

20 33 26 CMP Okay, it looks good.

20 33 29 ACDR Yep. Yep. Did you -

20 33 32 CMP RATE HIGH - ARMED.

20 33 36 ACDR RATE HIGH.

20 33 38 CMP EMS is DELTA-V - DET ... seconds.

20 33 46 DMP I only got a 35 on the 5 mark over here, Vance. I got 15 on the other one.

20 33 52 CMP 15 at minus 2 minutes.

20 33 54 DMP Oh, okay. 4 minutes to go on that.

20 33 56 CMP SPS N<sub>2</sub> and He.

20 33 59 DMP Okay. Stand by to ... 14, 15, 16 ...

20 34 06 CMP/DMP Yeah.

20 34 07 ACDR We pitch down after this ...

20 34 13 DMP Okay. 7 seconds - the secondary comes on at what, 2 seconds?

20 34 17 CMP About 3. Just long enough so you can see them separate, yet not so long that you interrupt the program because of your ... temperature. Okay, we're down to 18 degrees. Coming right in there.

20 34 35 CC-H Apollo, Houston. We're all GO here for your deorbit burn.

20 34 38 CMP Okay, Crip. Very good. So are we.

20 34 52 DMP Standing by for 59, huh?

20 34 54 CMP Yep.

20 35 21 DMP This will be different - doing SPS burn strapped in this way.

20 35 24 CMP (Chuckling)

20 35 25 DMP I've never done that before.

20 35 27 CMP It will be a longer jolt.

20 35 29 ACDR Yeah.

20 35 58 DMP ...

20 36 01 ACDR Pardon me.

20 36 03 DMP I said, we'll take ...

20 36 05 CMP Yeah, they're on.

20 36 09 DMP However, ... you need to remember where - ... pitch and yaw ...

20 36 47 ACDR Okay; 59.

20 36 48 CMP NORMAL.

20 36 50 ACDR NORMAL and THC POWER on.

20 36 51 CMP POWER on.

20 36 53 ACDR Okay. Do you have on - A/C ROLL on, too?

20 36 57 DMP Not now.



20 36 58 CMP No.

20 37 00 ACDR We've got four-jet ullage.

20 37 02 CMP We've got no requirement for A/C, since our roll jets are B/D.

20 37 07 ACDR Yep. We'll get them after the trim.

20 37 09 CMP ... 011.

20 37 11 ACDR Okay. Minus 25, DSKY lights.

20 37 13 CMP ... B.

20 37 19 ACDR Bank A, ARMED.

20 37 21 CMP She's ARMED.

20 37 23 ACDR Okay.

20 37 28 CMP ... 15 ...

20 37 32 ACDR Ullage. Delta-V's counting down. Both banks are looking good.

20 37 36 CMP Okay, you'll count her down to ...?

20 37 37 ACDR 10, 9, 8, 7, 6, 5, flashing 99, 4 - -

20 37 44 CMP PRO.

20 37 45 ACDR - - PROCEED, 2, 1 -

20 37 47 ACDR BURN, baby.

20 37 48 DMP Okay, you got BANK A - BANK B - -

20 37 52 ACDR Count her, and that's 6, 7 ... - Beautiful!

20 37 57 CMP ... is right on the nose.

20 37 59 ACDR Okay. Proceed.

20 38 01 CMP Okay. Let's trim it. Overburned a tad.

20 38 03 ACDR You did? Okay, pull her back. A/C ROLL on, ... - -

20 38 06 CMP As a matter of fact, I wondered if I didn't cut it off -

20 38 13 DMP I tried to give you a little lead time there on that - ... seconds.

20 38 17 CMP Right. (Laughter)

20 38 18 ACDR A/C ROLL.

20 38 20 CMP That's quite a buck you get, isn't it?

20 38 22 ACDR Yeah, I agree with that.

20 38 26 CMP Yeah.

20 38 27 ACDR ... trash. Using all the time - these God damn bread crumbs floating around.

20 38 34 CMP (Laughter)

20 38 36 DMP Yeah, he needs a cherry nutcake.

20 38 39 ACDR Okay -

20 38 40 CMP Okay, a little minus - -

20 38 43 ACDR A little minus and to the right. ... off. No, I don't either ...

20 38 48 DMP Kind of wish one of you guys could ...

20 38 51 ACDR You've got four jet.

20 38 53 CMP Okay.

20 38 55 ACDR Okay, 0, minus - minus 1, there we are - plus 2 - -

20 39 01 CMP/ACDR 0, 1 - -

20 39 02 ACDR And 0. PROCEED.

20 39 03 CMP Okay. PRO. Okay, go through the rest of the cue card ...

20 39 04 ACDR Okay, go ...

20 39 05 CMP Okay.

20 39 08 ACDR All locked up.  
20 39 09 CMP VERB 82 ENTER.  
20 39 10 CC-H Copied that.  
20 39 11 DMP Okay, 0, 0, VERB 82 ENTER.  
20 39 16 CMP Okay, GIMBAL MOTORS coming off.  
20 39 18 ACDR Looks like a real nice little perigee.  
20 39 20 CMP ... -  
20 39 19 CMP MARK. YAW 1 -  
20 39 21 CMP MARK.  
20 39 22 ACDR That looks good.  
20 39 23 CMP PITCH 2 -  
20 39 24 CMP MARK. YAW 2 -  
20 39 25 CMP MARK.  
20 39 26 ACDR Okay, they're off.  
20 39 28 CMP TVC SERVO POWER's - -  
20 39 32 ACDR Good.  
20 39 33 CMP Minus 18.4, Tom.  
20 39 34 ACDR Okay.  
20 39 35 DMP Okay, now we stay right here - -  
20 39 38 ACDR Minus 18. On the EMS.  
20 39 39 CMP Yeah.  
20 39 40 ACDR Okay, record the burn status.  
20 39 42 DMP Okay, and we stay with that ...

20 39 45 ACDR Yep. We sure do; all the way. Okay. VERB 66 ENTER.  
CM RCS check.

20 39 51 CMP Okay. Did you get the VERB 66 - -

20 39 53 ACDR I already got the VERB 66 ENTER.

20 39 56 CMP Okay. Okay, go ahead.

20 39 57 ACDR CM RCS check. AUTO RCS A/C ROLL, four, OFF.

20 40 00 CMP OFF.

20 40 01 ACDR Circuit breaker, RCS LOGIC, two, CLOSED.

20 40 04 CMP CLOSED.

20 40 05 ACDR SPACECRAFT CONTROL. SCS, MIN IMPULSE.

20 40 09 CMP Okay.

20 40 11 ACDR RATE 2, SCS.

20 40 12 CMP SCS.

20 40 13 ACDR MIN IMPULSE.

20 40 14 CMP MIN IMPULSE.

20 40 15 ACDR Okay. RS - CONTROL to CM - TRANSFER to CM. Okay. CM.

20 40 22 CMP Okay.

20 40 24 ACDR Okay, AUTO RCS, 1, OFF. We'll hear these little  
rascals fine.

20 40 31 CMP ... - -

20 40 32 ACDR Test ring 2.

20 40 35 CMP - - ...

20 40 36 ACDR Oh!

20 40 37 CMP ...

20 40 39 ACDR Don't hear anything. Go ahead, test ring 2. You got any firing?

20 40 43 CMP Yeah, I can hear it. Hear that?

20 40 46 DMP I can hear solenoids. I'm not sure I hear - -

20 40 49 CMP Yeah, I - I can see - -

20 40 50 ACDR Give it some roll.

20 40 51 CMP I can see the rates.

20 40 52 ACDR Yeah.

20 40 53 CMP That's all right.

20 40 54 ACDR Okay.

20 40 55 DMP Yeah, I can hear something going - bumpety-bump.

20 40 56 ACDR Okay. Ring 1, ON; ring 2, OFF.

20 41 03 CMP ... Okay. Now watch this. I can see the flashing of the lights.

20 41 12 ACDR Okay. Good show.

20 41 14 CMP Okay.

20 41 16 ACDR Okay. AUTO RCS ring 2, MNB. Okay, RCS TRANSFER, SERVICE MODULE. Okay, check that you got good thrust, using SCS. What was that? Should be MIN IMPULSE. Just check that you got SERVICE MODULE. Okay, you got it?

20 41 41 CMP Yeah.

20 41 42 ACDR Okay. Okay. BMAG MODE, three, ATT 1/RATE 2.

20 41 48 CMP ATT 1/RATE 2.

20 41 50 ACDR Okay. RATE COMMAND. You got all three RATE COMMAND?

20 41 53 CMP RATE COMMAND.

20 41 54 ACDR All right, you're in good shape. Okay. Ready to go?

20 42 00 CMP Yeah.

20 42 01 ACDR SM [sic]/service module SM sep checklist. PRIM - MAIN BUS TIES on, verify; they're on. LIM - PRIMARY GLYCOL TO RADIATOR, BYPASS, pull.

20 42 09 CMP Pull.

20 42 11 ACDR GLYCOL TEMP IN, MANUAL. GLYCOL EVAP TEMP IN, MANUAL.

20 42 16 DMP TEMP IN.

20 42 17 ACDR Okay. That's all right, you don't do it.

20 42 19 DMP You don't?

20 42 20 ACDR Because that's a primary loop. Circuit breakers, four, PITCH and YAW, OPEN.

20 42 26 CMP You mean the SPS?

20 42 27 ACDR SPS.

20 42 30 CMP OPEN.

20 42 31 ACDR Got those OPEN. Circuit breakers, ELS/SM SEP, two, CLOSED. Bottom row.

20 42 38 CMP Two CLOSED.

20 42 40 ACDR Okay. VHF AM A and B, off, center.

20 42 45 CMP Okay, A's off - B's off.

20 42 47 ACDR Okay, Crip, we're GO for your shutdown on the ATS. Over.

20 42 52 CC-H And you're GO to go ahead and do that, and we'll have you in about 7 minutes at ARIA - correction, Orroral.

20 43 00 ACDR Sounds good.

20 43 02 MS See you later.

20 43 03 CMP (To meet you soon on Earth.)

20 43 06 ACDR ATS-F POWER AMPLIFIER, off.

20 43 08 CMP Good.

20 43 09 ACDR ATS-F TRANSPONDER, off, and HIGH GAIN POWER, OFF.  
All three off; good. RHC POWER DIRECT 2, MNA and B.

20 43 16 CMP Okay. DIRECT, MAIN A/MAIN B.

20 43 20 ACDR COMMAND MODULE RCS LOGIC, on and up.

20 43 22 CMP CM RCS LOGIC; on, up.

20 43 24 ACDR STDN for contact, we don't have them. Just lost them. We're under the ATS. PYRO ARM.

20 43 30 CMP Okay. PYRO ARM.

20 43 31 ACDR Okay. Verify correct sep attitude. Okay, let me call this.

20 43 35 CMP We're there.

20 43 36 ACDR VERB 37 ENTER. 62 ENTER. Let's get average g up. Okay.

20 43 53 ACDR Okay, it says sep this - the command module. We got average g on. You ready to go? Okay, CSM/DM sep; here we go.

20 44 01 CMP Yeah.

20 44 02 ACDR Ready?

20 44 03 CMP Okay. Let her rip.

20 44 04 ACDR You check everything?

20 44 05 CMP Yep.

20 44 06 ACDR Okay - here we go.

20 44 08 DMP ... 16 W.

20 44 09 [SEPARATION]

20 44 10 DMP Okay.

20 44 11 CMP Pow. (Laugh)

20 44 12 ACDR Watch - Yawing back?  
 20 44 15 CMP Okay, we got control.  
 20 44 16 ACDR Okay, we got control. Whoof!  
 20 44 19 DMP Okay. You got bus voltage, batteries all look good.  
 20 44 23 CMP Gee, this ... spreads the dust.  
 20 44 25 ACDR Yeah, then you go MANUAL ATTITUDE, three, MIN IMPULSE.  
 20 44 28 CMP MIN IMPULSE.  
 20 44 29 ACDR RHC DIRECT 2, OFF.  
 20 44 32 CMP DIRECT 2, OFF.  
 20 44 35 ACDR BMAG MODE, three, to RATE 2.  
 20 44 37 CMP Okay. BMAG, three to - -  
 20 44 38 ACDR CAUTION AND WARNING to COMMAND MODULE, which Deke has already got.  
 20 44 41 DMP Got that.  
 20 44 43 ACDR CM RCS manifold pressure check, 1 and 2. 2 is norm, we'll stay there. Looks beautiful. SECS - -  
 20 44 50 CMP ... seeing the firing out your window, Deke.  
 20 44 52 ACDR SECS PYRO ARM, two, SAFE.  
 20 44 53 DMP Do what, Vance?  
 20 44 54 CMP Two, SAFE. Look out ... - -  
 20 44 57 ACDR AUTO RCS SELECT, 12, MNA/B; you've already done that.  
 20 45 00 CMP Yeah.  
 20 45 01 DMP You mean the thrusters?  
 20 45 02 CMP Yeah.  
 20 45 03 DMP Oh, yeah - -



20 45 04 ACDR CM RCS LOGIC, OFF.

20 45 05 CMP CM RCS LOGIC, OFF.

20 45 08 ACDR Okay. We got the CSM sep. Monitor delta-V ... - -

20 45 11 DMP You need a little more light here so you can see what you're doing.

20 45 13 ACDR Okay, voltage is good, Deke?

20 45 15 DMP Yeah, bus voltages are good.

20 45 16 ACDR Okay. Now let's recheck that.

20 45 18 DMP Batteries are good, pyro batteries are - -

20 45 20 ACDR Plus 22.0, minus 160. Okay. VERB 23 ENTER for the lift vector up.

20 45 29 DMP There's something weird going on on this one - -

20 45 30 ACDR Okay. You add minus 1 for lift vector down, minus - what?

20 45 35 CMP Lift vector up, yeah. That's right.

20 45 36 ACDR Minus 1. Now recheck just for sure.

20 45 38 CMP What'd you say, Deke?

20 49 40 ACDR Plus 022.00 - -

20 45 41 DMP Go ahead, Tom.

20 45 45 ACDR - - minus 163.00, and minus 1. Lift vector is up.

20 45 48 CMP Yeah, but - Deke, what did you say?

20 45 50 DMP I said we're getting an oscillation on the frigging amperage. There shouldn't be any on the pyro bats. I don't understand that.

20 45 56 ACDR What have you got for voltage?

20 45 58 DMP My voltage up there is 37, but we're just getting a -

20 46 01 ACDR But you don't read out amps on the pyro volts.

20 46 03 DMP Well -

20 46 04 ACDR Do you?

20 46 05 DMP Not unless you're drawing power on them. That's what's worrying me about them.

20 46 07 ACDR Okay, why don't you just monitor the pyro?

20 46 10 DMP Well, everything else is looking okay, so -

20 46 12 CMP Okay. We don't have the pyros tied. Is it on both of them?

20 46 16 DMP Yeah. Just sitting there bouncing. It may be an instrumentation problem.

20 46 20 CMP Okay. Just one thing to remember. We can always cut into the entry batteries for py - pyro power - -

20 46 24 DMP Yeah, that's right. Yeah.

20 46 25 CMP - - if we ever have to. It's down to 50.

20 46 27 ACDR Okay. We go a PROCEED. Again to recheck that finally.

20 46 30 DMP I'm going to ... one thing.

20 46 31 ACDR Plus 22.0, 16, minus 1, ... PROCEED. All right?

20 46 35 CMP Okay.

20 46 37 ACDR Okay. STDN for final target pad, EMS initialization, and pitch to pad .05g. Start your pitch. Got her?

20 46 49 CMP Okay, and - -

20 46 50 ACDR You can take this down; we don't need this bear any longer.

20 46 53 CMP Yeah. Let's see. Up to 5. Okay, give me initiation stuff.

20 47 04 ACDR Okay, EMS initialization. EMS FUNCTION, TEST 5.

20 47 10 CMP 5.

20 47 11 ACDR Verify scroll, 37K.

20 47 14 CMP Verified.

20 47 15 ACDR EMS FUNCTION, RANGE SET.

20 47 17 CMP RANGE SET. Plus range.

20 47 23 ACDR Okay. Set range to pad range-to-go. Pad range-to-go: 1637.1.

20 47 41 CMP It's at 1637.1.

20 47 43 ACDR Yep. Okay, 1637.1.

20 47 46 CMP Okay.

20 47 47 ACDR EMS to Vo SET; Vo SET is 25752. And we got at least 15 minutes before .05 G. We're in Fat City.

20 48 00 DMP Yeah.

20 48 03 DMP I just checked the mal procedures, and they don't even have anything for pyro bat failure for entry, but - -

20 48 10 ACDR Might go back and check - check the voltage.

20 48 11 DMP - - ... the switch. No, the voltage is great, there's no problem with voltage. You're right. There shouldn't be any amperage reading on the damn things, but it's just that they're oscillating.

20 48 20 CMP Okay, 25572; right?

20 48 23 ACDR 25752.

20 48 25 CMP Okay.

20 48 26 ACDR All right?

20 48 27 CMP Got it.

20 48 28 ACDR EMS MODE to STANDBY.

20 48 30 CMP Okay. STANDBY. Verified.

20 48 31 ACDR Verified. EMS FUNCTION, ENTRY.

20 48 34 CMP ENTRY.

20 48 37 ACDR Verify .05 G filter light is down.

20 48 39 CMP Down ...

20 48 40 ACDR Which it is. All right. Go to entry page E/2-1.  
Let's do that. Fucking bunch of shit.

20 48 50 DMP True.

20 48 51 CMP Well, there's the old Earth.

20 48 53 ACDR Got her out there, huh?

20 48 54 CMP Yeah.

20 48 55 DMP I'm glad to know it's still there.

20 48 56 CMP (Laughter) We're coming down to - -

20 48 58 ACDR Yeah. Would you believe we're going retrograde with  
heads down, which got to be lift vector up?

20 49 02 DMP How about that.

20 49 04 CMP Oh, boy.

20 49 05 ACDR All righty.

20 49 06 CMP Right.

20 49 08 DMP Well, I hate to come down; been a nice son of a  
bitch!

20 49 11 CMP (Laughter) Yeah. God damn, it's been a lot of fun,  
hasn't it?

20 49 14 ACDR It's been a ball.

DMP It sure has.

20 49 15 ACDR It's been 9 - -

20 49 16 CMP Really enjoyed it.

20 49 17 ACDR - - great days. Couldn't have been better, you  
know. I think we did about everything that was  
required.

20 49 25 DMP Hey, and there's the old Southern Cross, I do believe.

20 49 28 CMP Good.

20 49 29 DMP It's sitting right out the window.

20 49 30 ACDR Oh, yeah. That's a beauty, isn't it, Deke?

20 49 31 DMP Yeah.

20 49 33 CMP You don't get to see that very often.

20 49 34 ACDR Not very often.

20 49 36 DMP In fact, I haven't seen any stars at all this flight. Seems like we're in the cockpit all the nighttime, and -

20 49 40 CMP Yeah.

20 49 41 ACDR That's right. We haven't looked at them very often. And those stars should be moving from right to left.

20 49 48 CMP We got some sparklers out there.

20 49 50 ACDR Yeah, a lot of sparklers.

20 49 52 CMP They must be off the thrusters.

20 49 53 ACDR Those are off the thrusters. They're ablative thrusters, yeah, they ... that stuff.

20 49 56 DMP Yeah.

20 49 57 CMP Look at them! Look at them!

20 49 58 ACDR Isn't that something?

20 49 59 CMP Uh-huh. (Laughter)

20 50 00 ACDR I don't remember those before.

20 50 01 CMP Hey, it's coming out - that's because - -

20 50 02 ACDR Oh, that's the Sun.

20 50 03 CMP - - the Sun's coming up.

20 50 04 ACDR We're in the frigging Sun - -  
 20 50 05 CMP God! Isn't that something!  
 10 50 06 DMP God dam. I wonder - Shit!  
 20 50 08 CMP Think I'll try it!  
 20 50 09 ACDR Try it.  
 20 50 10 DMP Try it.  
 CMP (Laughter)  
  
 20 50 11 ACDR Full open. Go to f/2 and - -  
 20 50 12 DMP f/2, wide open. We'll see what happens.  
 20 50 14 CMP Yeah, I bet you'll get something.  
 20 50 15 DMP We've got nothing to lose. And go to about f/2,  
 about half a second; put it in - -  
 20 50 20 CMP Yeah, give it - -  
 20 50 21 DMP - - wide open.  
 20 50 22 CMP - - fast enough so they won't be all streamers.  
 20 50 23 DMP Yeah.  
 20 50 24 ACDR Yeah.  
 20 50 25 DMP Okay, well, I'll just ... a couple when the - if I  
 could do it when the fucking thrusters aren't firing.  
 20 50 29 CMP (Laughter)  
 20 50 31 DMP Shit! I moved it too fast. Sometimes you can't  
 really tell it from stars.  
 20 50 35 ACDR Just tell - just tell Vance to open thrust.  
 20 50 38 CMP Yeah. Tell me when to thrust, I'll give you a  
 flashbulb.

20 50 41 DMP Okay, well - but I don't want that much light - -

20 50 42 CMP I know it. (Laughter)

20 50 44 DMP I don't know, it might - Ah, I bet that one did.

20 50 49 CMP (Laughter) Sorry.

20 50 50 DMP That son of a bitch!

20 50 53 CMP (Laughter) Well, maybe you'll get the flash.

20 50 54 DMP Hey, that's - that's beautiful.

20 50 56 CMP I won't thrust this time. It's instinctive to thrust when I have to.

20 50 59 DMP Well, let me play - Oh, hell, yeah; go ahead. I'm going to play a Ralph Morris here, and try some different settings since we got so much film. Maybe something will work.

20 51 08 CMP Okay. Good burn, good sep, and we're coasting down to .05g. How do you read, Crip?

20 51 22 ACDR Hello, Houston; Apollo. How do you read?

20 51 24 CC-H And, Apollo, be advised that we have ...

20 51 28 CMP Okay, that's good.

20 51 31 DMP How are you reading us, Crip?

20 51 32 CC-H Loud and clear, how me?

20 51 34 DMP Okay. You guys got data down there now?

20 51 36 CC-H That's affirm. We've got ... Orroral.

20 51 39 DMP Okay. How about telling them to take a look at our pyro batteries? I'm showing a amp oscillation. About a minus 2 to plus 2. I don't think it's anything, but I never noticed it before, so they might want to look at them.

20 52 04 CMP Hey, look at behind you, Tom.

20 52 05 ACDR Yeah.

20 52 06 CMP That's the Sun coming up.

20 52 07 ACDR Yeah, isn't that beautiful? Fantastic. You're about there. Coming up .05g; pitch .05g.

20 52 15 CMP Yeah, I guess I better get some lights - on top of this ... Go ahead.

20 52 18 ACDR Yeah, we got plenty of time.

20 52 21 DMP 20 - Yeah, we still got 12 minutes, haven't we?

20 52 23 CMP Yeah.

20 52 25 ACDR Yeah. Well, leave them down. It'll be sunlight in a couple of minutes.

20 52 29 CMP Get those sparklers while you can.

20 52 31 DMP Yeah. Yeah, let me try a couple more here.

20 52 34 ACDR Look how they're turning red right up here in the top.

20 52 36 CMP Some of them are, yeah. Must be that - just the propellant, huh?

20 52 46 DMP Well, it'll be interesting to see if I can get that or not.

20 52 53 CMP Yeah.

20 52 55 CC-H ...

20 52 59 DMP That's affirm - pyro. And they should nominally be reading zero, and they're just oscillating there, and I'm assuming that's that instrumentation thing, but -

20 53 09 CC-H That - that's affirmative. ...

20 53 13 DMP Okay.

20 53 15 CC-H Okay, we're about to go ... here at Orroral, ... blackout through ARIA.

20 53 22 DMP Roger.



20 53 28 CMP 46 degrees, right? And I'll trade with you.

20 53 33 ACDR Yeah, okay. B.

20 53 50 DMP Well, now let's see here. Maybe I'll shoot some of that mag anyway. Well, I think I'll try to get some stills of entry if it looks like we're seeing anything.

20 54 00 ACDR It's going to be pretty - -

20 54 02 DMP Pretty bright.

20 54 03 ACDR Yeah, so you better set it up to about - -

20 54 04 DMP Probably 1000.

20 54 05 ACDR - - Well, 500 is good.

20 54 08 DMP Good.

20 54 09 ACDR I'd say shoot it about f/16 - -

20 54 12 DMP I'll see what the - -

20 54 13 ACDR - - 18.

20 54 14 DMP - - light meter might give us a good reading on it.

20 54 15 ACDR 16, 8, 22.

20 54 16 DMP ... Okay.

20 54 19 ACDR Okay. Vance, don't have much to do.

20 54 22 CMP Okay, verify the MAIN BUS TIES are still on - -

20 54 24 ACDR Okay.

20 54 25 CMP - - and we wouldn't have power if they weren't.

20 54 27 ACDR It's 46 degrees and you're right there.

20 54 30 DMP Both bus voltages are up - A is 28.2, B is about the same.

20 54 33 ACDR GDC's right on the IMU. Ring 1 and ring 2 looks like we've hardly used any propellant.

20 54 43 DMP 16 ... 29.

20 54 45 CMP I'd like to see for a minute if the DAP controls like - it does in the simulator.

20 54 50 ACDR Oops! Watch it.

20 54 52 DMP 54. What was that? Guess it ... Go back to work in there.

20 54 58 CMP (Chuckling) It does.

20 54 59 ACDR It takes - yeah.

20 55 00 CMP That son of a bitch.

20 55 01 ACDR It takes you right back.

20 55 02 CMP Yeah.

20 55 03 ACDR That's just logic to take you right back to track.

20 55 05 CMP Yeah. That son of a bitch really goes.

20 55 15 ACDR ... knows yet that that's a - -

20 55 16 CMP A lot more - yeah, it's a lot more crisp than in the CMS, I'll say that.

20 55 19 DMP Pulling a lot more amperage than I thought we would. ...

20 55 29 ACDR Okay. Okay, the time of .05g just to recheck - -

20 55 38 DMP 26:25.

20 55 39 ACDR 26:25. And at 5 minutes, minus .05g, you can go to 5 and 5; hell, that's your choice; do what you want to. I'd stay right there and keep those rates going.

20 55 46 CMP What time have you got?

20 55 48 ACDR I'll give you time on that. That would be 21:25.

20 55 54 CMP Okay. Let's see if - right in here, you want to check the IMU versus the GDC, too, don't you?

Day 205

20 56 04 ACDR 2 minutes, so we got to - Ooh, 23 - we got 5 minutes to go until that. It's looking damn good. GDC is off a little bit in yaw, not much. What do you got - what do you read for pitch?

20 56 19 CMP What do I need - read?

20 56 20 ACDR What do you read?

20 56 21 CMP About 46.

20 56 24 ACDR Yeah, I'm reading 47-1/2. Roll's right on. Yaw is maybe 1 degree left. That's probably from hysteresis, I mean left parallax.

20 56 47 ACDR Here's your horizon coming in, and we're going - -

20 56 49 CMP The sky's getting just a teeny bit blue, not much.

20 56 53 DMP (Yawn)

20 56 54 ACDR No, you don't get much yet.

20 56 56 DMP No, we're still up there pretty high.

20 57 02 DMP If you guys see anything out your windows you want to shoot, why I'll pass you the camera; I'm just sitting here. Well, I'll see what kind - -

20 57 08 CMP Well -

20 57 09 DMP - - of light reading - reading I get out there.

20 57 11 CMP Man, are we moving. (Laughter)

20 57 13 ACDR Yeah, you can - as we drop lower, you can see we're going to be moving like a son of a gun there.

20 57 18 DMP Like a scalded-ass ape, huh?

20 57 20 ACDR Okay, the initial bank angle -

20 57 25 DMP I think I'm going to shoot a reentry photo here or so - -

20 57 28 CMP Hey, get one or two out the side there.

20 57 30 DMP That's what I'm doing, just holding her out the window there where I can't see - -

20 57 33 CMP Beautiful!

20 57 34 DMP - - and shoot them a couple. So I think we got a nice angle on it. Looks to me like we're - we're still pretty flat, I guess.

20 57 42 ACDR Yeah, it - it drops in pretty steep at the last.

20 57 46 ACDR (Humming) Okay, 20 minutes.

20 57 53 DMP Oops!

20 57 54 CMP 26:25 is .05g.

20 57 56 DMP There's a big old ... out there. (Laughter) Look at that fucker.

20 58 02 ACDR Okay. Okay, minus 2 minutes would be - 23 plus 25.

20 58 44 DMP 5 minutes yet before we ... Man, it sure rides smooth, doesn't it?

20 58 48 ACDR We're yawing down a little bit and pitching. We're starting to pick up some atmosphere.

20 58 52 DMP Yeah.

20 58 55 ACDR That's why I like to stay 5 and 1 longer than what they call for in the checklist. You want me to fly it for you where you can - -

20 59 11 DMP It almost - -

20 59 12 CMP Nah, it'll be okay.

20 59 13 DMP - - feels like you can feel this son of a bitch accelerating.

20 59 15 ACDR You can look down and you see we're getting low - look at that cloud go by, Vance.

20 59 18 CMP Yeah.

20 59 20 ACDR Okay.

20 59 25 CDR Okay. 21:25, .05g minus 5 minutes. FDAI SCALE 5 and 5. I'd - I'd say that's your option.

20 59 33 CMP Yeah, a little more. Doesn't like that trim, does it?

20 59 40 ACDR Getting some aero. Oh, look at that stuff go by.

20 59 43 CMP Now you know you're moving. (Laughter)

20 59 45 DMP Jesus, we're really hauling the fucking mail.

20 59 47 ACDR (Laughter)

20 59 48 DMP Of course, we've been doing this right along.

20 59 52 CMP We're just closer, we don't - -

20 59 53 ACDR We're just getting a hell of a lot closer. You're getting it - we'll soon be about half as close as we were.

20 59 57 DMP Yeah.

20 59 58 ACDR Okay, you squared away?

20 59 59 CMP Yeah, just about.

21 00 04 DMP It sure would be nice to have a movie camera to shoot out that window to pick that up.

21 00 14 ACDR Okay. At 23 plus 25, it's .05g minus -

21 00 23 DMP Okay, we still got about 800 in the PS - in the surge tank.

21 00 27 ACDR Okay, in good shape.

21 00 29 DMP Our rings are beautiful.

21 00 32 CMP Lost comm.

21 00 33 ACDR Huh? You lost comm?

21 00 37 ACDR That's okay.

21 00 39 DMP We can hear you.

21 00 40 ACDR We can hear you.

21 00 41 CMP ... hear ...

21 00 42 ACDR Did you get that closed?

21 00 43 DMP Well, I can - I can hear you talking. I don't - but not on intercom.

21 00 48 ACDR That's okay, Vance.

21 00 49 CMP ...

21 00 53 DMP You can hear us so -

21 00 55 ACDR Well, he can hear me, Deke.

21 00 56 DMP Yeah.

21 00 57 ACDR Why don't we get our mou - mikes up close? Get your mike up - -

21 00 59 DMP No, he's lost his intercom there somewhere, but what the hell, he's talking.

21 01 02 CMP Yeah, I can hear you talking.

21 01 04 ACDR You can hear me.

21 01 05 DMP Okay.

21 01 07 ACDR All right, Vance.

21 01 08 CMP You can hear me?

21 01 09 ACDR Yeah. No.

21 01 10 DMP No, we can hear you but not through the comm. It doesn't matter, we can hear you.

21 01 15 ACDR Okay, why don't we just strap - tighten these things - tighten these straps down a little bit.

21 01 22 DMP Yeah, I cinched mine there before we ever started.

21 01 26 ACDR Really pop them in now.

21 01 45 ACDR Back with us?

21 01 46 CMP Yeah.

21 01 48 ACDR Rotate it towards you.

21 01 49 DMP What happened?

21 01 50 CMP The darn thing must not have been locked, it came off.

21 01 52 DMP Yeah.

21 01 56 CMP/ACDR Okay.

21 01 57 DMP We can hear you talking.

21 01 58 ACDR 24:10.

21 02 01 DMP By golly, I think I'm beginning to pick up a little color out this window.

21 02 04 ACDR I don't know, the sky's still pretty - -

21 02 05 DMP Oh, yeah! Shit, man, we're - -

21 02 07 ACDR Look at the - Hey, turn on your camera, Deke.

21 02 09 CMP Hey, yeah; it's getting red.

21 02 10 ACDR That's the fireball. Get her going.

21 02 12 DMP I got it running.

21 02 13 ACDR Okay, a hundredth of a g. Okay.

21 02 18 DMP Okay, wait a minute. You want it on 6? I didn't have it on 6.

21 02 20 ACDR Yeah. I'll be watching how much we're using. Okay, now there's the fireball - -

21 02 27 DMP Okay, let's save some for the - -

21 02 28 ACDR - - like a big copper cloud.

21 02 29 DMP Yeah, that's what it looks like.

21 02 30 ACDR Okay.

21 02 31 ACDR We got lift up - -

21 02 32 DMP Now, see if there is any way to - -  
 21 02 33 ACDR - - you'd better believe it.  
 21 02 34 CMP Look at the sparklers coming off.  
 21 02 35 ACDR Okay, stand by at .05g for EMS MODE BACKUP/RANGING.  
 21 02 38 CMP Right; 26:25.  
 21 02 40 ACDR 26:25.  
 21 02 41 DMP Shit!  
 21 02 48 CMP GDC and IMU agree good.  
 21 02 51 ACDR We're in good shape. 26:25. There's 100.  
 21 02 56 DMP Oh, man! Look at that out there.  
 21 02 57 ACDR Come on, baby. Dig in some more. Pick up a little more g's up there, baby.  
 21 03 02 CMP She wants to go where she wants to go.  
 21 03 04 ACDR 016, should we have - -  
 21 03 07 CMP Okay. Looks like we're going to have good agreement. ...  
 21 03 12 ACDR Should have more - should be a 16 64.  
 21 03 16 CMP Okay, we got a minute until .05g.  
 21 03 18 ACDR Okay. Yeah, you're right.  
 21 03 21 DMP Jesus Christ, we got a minute to go yet?  
 21 03 22 ACDR Yeah.  
 21 03 23 CMP Yeah, that's - -  
 21 03 24 ACDR That's where most of your fireball is; out there.  
 21 03 27 CMP Boy, it's funny how that - -  
 21 03 28 DMP Yeah, but I'm worried about running out of film.



21 03 30 ACDR Okay, good. Deke, why don't you go back to this - -

21 03 35 DMP Let me go back to 2, because we started a minute and a half early there. Hell, there's noway that God damned film is going to last -

21 03 42 CMP Yeah.

21 03 43 ACDR There's two-tenths of a - two-hundredths of a g.

21 03 47 CMP Okay, it's 26 - we got 25 seconds.

21 03 49 DMP Hmm.

21 03 50 ACDR Three-tenths.

21 03 53 DMP Tell you, as soon as I see something - -

21 03 54 ACDR There goes some shit flying by.

21 03 56 DMP - - that looks different, Tom, I'll ... - -

21 03 57 ACDR Four-tenths. Okay.

21 03 59 CMP There you are.

21 04 00 ACDR Back to 3, back to 4. 26:25 - 18, 19, 20, 21, 22 - 3, 24, 25 -

21 04 14 CMP It's running.

21 04 15 ACDR 26. Okay. EMS ROLL, on. EMS ROLL.

21 04 18 CMP EMS, on.

21 04 19 ACDR .05g.

21 04 20 CMP .05g and we're waiting for - two-tenths.

21 04 22 ACDR That was about 26 - 26.

21 04 23 DMP Damn it.

21 04 26 CMP Yeah, that's very good.

21 04 28 ACDR Beautiful agreement.

21 04 29 CMP Tom! Look at it out the side there.

21 04 30 ACDR Okay, look at the Beta; Beta at 06 74. Now you're starting to feel something. .05g is on, and we're coming down good.

21 04 38 CMP We're up to seven-tenths g; eight-tenths.

21 04 41 ACDR No, we're not. That's seven-hundredths - seven-tenths - -

21 04 44 CMP Seven-hundredths, I mean.

21 04 45 ACDR (Laughter)

21 04 47 CMP I mean on the way to two-tenths.

21 04 48 DMP Oh, shit.

21 04 49 CMP Look at that up ahead.

21 04 51 DMP Isn't that beautiful!

21 04 52 CMP Or - behind rather.

21 04 53 DMP That doesn't change enough though, Tom, I don't think, to matter whether you're shooting - 2 or 6.

21 04 57 ACDR Probably not.

21 04 58 DMP Even though there's a - -

21 04 59 ACDR There's a tenth of a g.

21 05 01 DMP Not much difference between frames.

21 05 03 ACDR Oh, man -

21 05 04 CMP Man, look at that!

21 05 05 ACDR Yeah, okay, let's - down range error check at two - -

21 05 08 CMP Now, got that - got her going on that one? Good. Okay, ll.

21 05 14 ACDR ll.

21 05 17 CMP Beautiful; God damn.

21 05 19 ACDR Isn't that something?

21 05 20 CMP Beautiful.

21 05 21 ACDR See that stuff flowing past?

21 05 24 CMP Okay, get me in a VERB -

21 05 26 ACDR Want to hit a VERB? Okay, 15. Next one occurs at 27:51. Just watch your correlation. 16-17. 18.

21 05 43 CMP We're going to get there ahead of them.

21 05 44 DMP Yeah, we - -

21 05 45 ACDR 19.

21 05 47 DMP - - get through .05g earlier.

21 05 51 ACDR 20. There it is - 66. Okay, hit it. Right?

21 05 56 CMP 66 7, calling for a polarity negative -

21 06 00 ACDR Yeah.

21 06 01 CMP 391 and what - -

21 06 02 ACDR 391 - -

21 06 03 CMP - - was the number they gave me on the pad?

21 06 04 ACDR 391 is 447.

21 06 05 CMP Okay, that's close.

21 06 07 ACDR 39 - -

21 06 08 CMP I'm giving it to the G&N.

21 06 09 ACDR 391 point - -

21 06 11 CMP When it thrusts, you see how it affects the - the pattern out there?

21 06 14 ACDR Okay, go to 5 and 5 on your scale, Vance.

21 06 15 CMP Yeah.

21 06 16 DMP Man, that's beautiful.

21 06 17 ACDR Okay, KEY RELEASE.

21 06 20 CMP That's something. Look at that out at the left. Beautiful, god, beautiful!

21 06 24 ACDR Got a beautiful capture.

21 06 25 CMP Something - piece out there is flying wing on us.

21 06 27 ACDR We got a cross range of 23.5 - I mean, cross range of 55 and a down range of 2 - 21 - 210 and coming in.

21 06 39 CMP Okay, we're just doing great.

21 06 42 DMP We're captured.

21 06 44 ACDR Okay, the next time we want it in is the - 27:51.

21 06 57 CMP This - this lasts a hell of a long time. Makes kind of a curlycue out there.

21 07 01 ACDR Yeah, it's the vortex. Last for 5 minutes. About 27 - we have about 27:49.

21 07 07 CMP Okay.

21 07 08 ACDR Record DAP data.

21 07 09 CMP We got a proper direction and roll.

21 07 14 ACDR Okay, 29:17, minus 15 2. Next thing is going to be the reverse bank angle, which is 33:42. And the film mag is looking pretty good, check - Deke.

21 07 27 DMP Yeah, I went back to 2, Tom, because I wasn't - -

21 07 28 ACDR Okay.

21 07 29 DMP - - seeing enough change in the ... - -

21 07 30 ACDR Yeah.

21 07 32 DMP - - to warrant - -

21 07 33 ACDR Okay.

21 07 34 DMP - - you rolling.

21 07 36 CMP Okay, it's going over to 52 degrees.

21 07 39 ACDR Okay.

21 07 40 CMP Start taking out our cross range.

21 07 41 ACDR Yep.

21 07 43 DMP Man, that is beautiful.

21 07 45 CMP Wow, look out the top window there.

21 07 47 DMP Whoo, look at that!

21 07 48 ACDR Yep.

21 07 49 DMP It's beautiful.

21 07 50 CMP Man, are we skittering.

21 07 54 CMP Minus 84.

21 07 55 DMP I can't believe I'm getting it with this camera, but maybe I am.

21 08 00 CMP Oh, god, that's beautiful; I hope you got a good picture there, Deke.

21 08 03 DMP I'm trying. I'm shooting the hell out this window.

21 08 06 ACDR What's your ... - -

21 08 07 CMP 33:42.

21 08 08 DMP I just hope the hell we got the right settings.

21 08 10 ACDR He's really trying to - -

21 08 11 CMP Minus 106.

21 08 13 ACDR He's really trying to - pull off ... a few g's here.

21 08 15 CMP Yeah, man.

21 08 16 ACDR See, we - we're only up to about a third of a g.

21 08 17 CMP Yeah.

21 08 19 ACDR See, we -

21 08 22 CMP Yeah, look at that. He's still - 1100 miles out and he's got to get down in about 600 -

21 08 27 ACDR We're going to - Here come - here come the g's Okay, just keep - -

21 08 30 DMP Oh, man.

21 08 31 CMP Man, we're overshooting one hell of a lot.

21 08 32 DMP Are we?

21 08 33 ACDR Yeah.

21 08 34 CMP Yeah.

21 08 35 ACDR It's got 114 - -

21 08 36 CMP 114 miles.

21 08 37 ACDR He can pull it out; no shit. That's -

21 08 38 CMP Oh, yeah. Look at that! Look at that thing out there now.

21 08 40 DMP Oh, yeah.

21 08 41 ACDR Here we go! We're coming up eight-tenths of a g.

21 08 42 CMP Yeah.

21 08 43 ACDR 86. Look how he's pulling that out; 77 miles.

21 08 46 DMP That's only eight-tenths of a g?

21 08 47 ACDR Yep. Like - -

21 08 48 DMP Shit!

21 08 49 ACDR - - like I told you, we're only - we're not even up to one g yet (laughter).

21 08 52 DMP Christ!

21 08 53 ACDR Okay, here we go! 60 miles to go; 41 cross range. The cross range is down to 41.

21 08 57 DMP Hard to believe.

21 08 59 CMP He's going to get that cross range all the way out.

21 09 01 ACDR You better believe it. 60 miles on it -

21 09 03 CMP God! We're looking low. (Laughter)

21 09 05 ACDR Yep! We sure are.

21 09 06 DMP Okay, I'm watching for steam pressures.

21 09 08 CMP Yep.

21 09 09 ACDR Okay.

21 09 10 CMP Well, I know we're not.

21 09 11 ACDR 38. Okay, we're up to - to 1-1/2 g's. (Laughter)

21 09 14 DMP Oh, man! Feels like - -

21 09 15 ACDR Okay. 36 cross range, 45 down range. Okay.

21 09 21 CMP 2 g's.

21 09 22 ACDR 2 g's.

21 09 23 DMP Shit. Man, it feels - -

21 09 24 ACDR Feels like you're really pulling the old thing.  
(Laughter)

21 09 25 DMP - - like 6 g's.

21 09 26 CMP It's doing it just right on the EMS.

21 09 27 ACDR Yeah. Okay.

21 09 30 DMP Okay, I'm going to keep shooting away here and do  
this ... again.

21 09 31 ACDR Returning to Earth, okay.

21 09 32 CMP (Laughter)

21 09 34 ACDR 31 cross range, 7 down range. He'll put it out  
some more. 30 cross range -

21 09 41 DMP As long as I can get the camera - -

21 09 42 ACDR 28 cross range -

21 09 44 DMP - - up there, we'll get pictures.

21 09 45 ACDR Okay. 10, down range. Now we're pulling some, up to 3 g's. And 9.5, 25 cross - 3 g's.

21 09 58 CMP 42. It's doing just right.

21 09 59 ACDR Yep. 22 cross range, we're going to beat it.

21 10 03 DMP ...

21 10 05 CMP 3.2 g's.

21 10 07 DMP Okay.

21 10 09 ACDR Down to 17 000 feet per second, and we're 19 miles cross range, 10 down range.

21 10 16 CMP (Coughing)

21 10 18 ACDR Okay, 17.

21 10 20 CMP That fireball lasts a long time.

21 10 21 ACDR Yeah.

21 10 22 DMP It sure does.

21 10 23 CMP Minus 15.

21 10 24 DMP Gosh, I'm getting stills of it.

21 10 26 CMP (Coughing)

21 10 28 ACDR 210 to go, 206. 13. It looks good. 11. 14 500 velocity.

21 10 37 CMP 8 miles. Or, no, 11 miles.

21 10 42 ACDR 10 miles.

21 10 43 CMP I was thinking of something else.

21 10 44 ACDR 9 miles.

21 10 45 CMP (Coughing) Cross - (coughing) cross range is 8.



21 10 48 ACDR Okay, reverse bank time is 33:42.

21 10 50 CMP Okay.

21 10 51 ACDR Okay, we're pulling 3 g's. He'll overshoot and then reverse it. 6 miles cross range. There we go, baby.

21 11 00 CMP Yeah.

21 11 01 ACDR Don't worry about it.

21 11 02 DMP Okay, we got rid of most of the fireball.

21 11 03 ACDR Still minus. Looks - 38. (Chuckling) Look at that smart little computer.

21 11 09 CMP There, it reversed signs.

21 11 10 ACDR Yeah.

21 11 11 CMP Okay, reverse.

21 11 13 ACDR It'll do it.

21 11 15 CMP No, it - -

21 11 16 ACDR It - it will.

21 11 17 CMP - - didn't - didn't reverse in register 1.

21 11 19 CC-H Apollo, Houston. Talking at you through ARIA.

21 11 21 ACDR Roger.

21 11 22 CMP Loud and que - clear, Crip. Doing fine.

21 11 24 ACDR 309.

21 11 26 CC-H ...

21 11 27 DMP Yeah, we're doing - doing just great.

21 11 29 ACDR That computer is steering it right out, Crip. 33:42.

21 11 38 CMP Okay, got a minus 610.

21 11 39 ACDR There's minus - -

21 11 40 CC-H Roger, Tom. You're ...  
 21 11 41 ACDR - - minus - minus. That son of a bitch!  
 21 11 44 CMP He's got us - steering just right.  
 21 11 47 ACDR There! There we go.  
 21 11 48 DMP We're ... in good shape, Crip.  
 21 11 49 ACDR There we go.  
 21 11 51 CMP (Chuckling) That's one heck of a maneuver, isn't it?  
 21 11 55 ACDR ... See that yaw?  
 21 11 56 CMP Yeah.  
 21 11 57 ACDR Okay, we're down to 7000 feet per second.  
 21 12 01 DMP How many g's we pulling now?  
 21 12 03 ACDR The g's backed off to 2-1/2 g's, and she - that little baby's steering it right out.  
 21 12 07 CMP It holds 2-1/2 a lot longer than I thought it would.  
 21 12 11 ACDR Yep. 1.2 in the ...  
 21 12 13 DMP I don't see any fireball anymore; I'm going to turn the camera off.  
 21 12 15 ACDR Turn it off, Deke. Might set it up for 6, 8, and a sec later on.  
 21 12 20 DMP Yeah, ...  
 21 12 22 ACDR Two to go on steam pressure.  
 21 12 23 CMP Still got some film left there, Deke?  
 21 12 25 DMP Oh, yeah.  
 21 12 26 ACDR Don't move your head - -  
 21 12 27 DMP I want to save some for - -  
 21 12 28 ACDR - - ... it's reversing.

21 12 29 DMP - - for the drogues and the mains. Oh, shit! We're on SECONDARY.

21 12 35 ACDR ... reverse - ... it missed that. Okay.

21 12 40 CMP Okay, how - should be getting steam pressure, huh? About now?

21 12 42 DMP Yeah, shit. We've been on - we been in PRIMARY. I don't know when - we should be 90K, huh?

21 12 46 CMP Yeah. We had SECONDARY on for a while.

21 12 50 ACDR Okay, let's look at the time for - the next time is - drogues is 36:27. Okay, stand by for this thing off the peg.

21 13 00 CMP Okay.

21 13 01 ACDR It's trying to steer it out.

21 13 04 CMP ... got 8 - Damn.

21 13 09 ACDR Okay.

21 13 11 DMP There we are.

21 13 14 ACDR Okay. Drogues at 36:27 - -

21 13 16 DMP They want that at 12 frames?

21 13 19 ACDR 1 minute to drogues.

21 13 21 DMP Okay, give me a 30K mark, will you, Tom?

21 13 23 ACDR Okay.

21 13 24 CMP I will. One of us will.

21 13 28 ACDR Okay, 36:27.

21 13 31 DMP We at 50K?

21 13 32 ACDR Not yet.

21 13 33 DMP Okay.

21 13 34 CMP Okay, here comes 50K - -

21 13 38 ACDR Okay, altimeter's coming off the peg.

21 13 40 CMP 50K.

21 13 41 ACDR Nine-tenths of a mile miss distance. Key in VERB.  
No, pardon me - seven-tenths; this baby is right on.

21 13 48 ACDR 45K. Okay, at 30K - -

21 13 52 CC-H ... looking good here; we got data and we got - we  
got you in radar contact at the ship.

21 13 55 ACDR Okay, we got her hook down. Okay, 30K - -

21 13 56 CMP Okay, what comes - -

21 13 58 ACDR - - for the pyros.

21 14 01 CMP You got the pyros coming on.

21 14 03 ACDR Okay, 30K for the pyros.

21 14 04 CMP BOOST/ENTRY.

21 14 05 ACDR BOOST/ENTRY.

21 14 06 CMP What else is on your checklist?

21 04 07 DMP That's it. BOOST/ENTRY - -

21 14 08 CMP Okay.

21 14 09 DMP - - and SECS PYRO at 50.

21 14 11 CMP All right.

21 14 12 DMP At 30, give me a hack and I'll - it's ELS, LOGIC,  
AUTO, and I'll start the DAC.

21 14 16 ACDR Okay. Stand by, it's -

21 14 17 ACDR 30.- 27K. Start your DAC.

21 14 18 DMP Okay, she's running.

21 14 19 ACDR Okay, 26K.

21 14 20 CMP Okay, stand by for drogues.

21 14 22 DMP Okay.

21 14 23 ACDR 24K.

21 14 28 ACDR Did she come out? Any drogues?

21 14 30 DMP Don't see them.

21 14 31 CMP Don't see any.

21 14 34 DMP Did you hit your button - there?

21 14 37 DMP There's the apex cover.

21 14 40 ACDR There they are.

21 14 41 CMP I hit a ...

21 14 42 ACDR ...

21 14 46 DMP Got them.

21 14 49 DMP And we're on the drogues.

21 14 50 ACDR Yep.

21 14 51 CMP Yes, sir.

21 14 54 ACDR I got the PROPELLANTS, OFF.

21 14 56 DMP How are you running on altitude?

21 14 57 CMP Quite a ride, you know? (Cough)

21 14 59 DMP O<sub>2</sub> FLOW HIGH.

21 15 00 ACDR Okay, coming down at 11 000.

21 15 02 CMP (Coughing)

21 15 03 DMP Wouldn't worry about that.

21 15 04 CMP (Coughing)

21 15 06 ACDR Stand by for the main; ELS, LOG - LOGIC -

21 15 08 ACDR AUTO! AUTO!

21 15 09 ACDR Oh, hell. LOGIC and AUTO!

21 15 11 CMP (Coughing)  
 21 15 14 DMP Boy, there's a lot of - gas in here.  
 21 15 17 ACDR Push the MAINS!  
 21 15 18 ACDR/DMP (Coughing)  
 21 15 21 ACDR I'll bet that fucking barostat's completely iced.  
 21 15 23 CMP/DMP (Coughing)  
 21 15 24 ACDR I'll bet that barostat was frozen.  
 21 15 26 CMP/DMP (Coughing)  
 21 15 30 ACDR Goddamn, I got the -  
 21 15 33 CMP (Coughing)  
 21 15 34 ACDR Okay, we're on the mains.  
 21 15 37 CMP Purge.  
 21 15 38 ACDR No, no, no, no.  
 21 15 39 DMP Don't - don't touch.  
 21 15 40 CMP No, no.  
 21 15 42 DMP What's the matter?  
 21 15 43 DMP I don't know what the hell we got here.  
 21 15 46 CMP (Coughing)  
 21 15 47 ACDR How's the cabin pressure?  
 21 15 48 DMP It's coming up (coughing). It's okay, it's (cough) 2.  
 21 15 52 CMP/DMP (Coughing)  
 21 15 54 CMP Hey, we forgot these -  
 21 15 58 CMP (Coughing)  
 21 15 59 ACDR I called them off - ELS, LO - LOGIC, didn't I?

21 16 03 REC \*\*\* my position is 025 degrees. I am on the New Orleans 169 degree radial, 7.5 nautical miles.

21 16 14 NEW New Orleans; roger. Out.

21 16 15 DMP ...

21 16 16 ACDR Huh?

21 16 17 CMP Strut locked?

21 16 19 REC Apollo, Recovery. Over.

21 16 22 DMP I did.

21 16 23 ACDR I've got those propellants off, I don't know why the hell it got that shit in here.

21 16 25 DMP Oh, man!

21 16 26 REC Apollo, this is Recovery broadcasting in the blind. Switching to Astro voice, secondary.

21 16 34 CMP What the hell's - -

21 16 35 ACDR Okay, 10K - VHF ANTENNA, RECOVERY, and SIMPLEX.

21 16 37 CMP (Coughing)

21 16 38 DMP Yeah, I got that.

21 16 39 CMP (Coughing)

21 16 40 ACDR Okay.

21 16 43 DMP FLIGHT POSTLANDING (cough) -

21 16 45 DMP Here it goes.

21 16 47 CMP (Coughing)

21 16 49 ACDR Okay, E - EMS, OFF/STANDBY if you get a chance; it doesn't matter.

21 16 52 ACDR Coming through 2800 feet.

21 16 53 DMP That ...

21 16 56 ACDR God damn; boy!

21 16 59 REC Apollo, this is Recovery broadcasting in the blind - -

21 17 02 CMP Okay, what next?

21 17 03 REC - - no reception on Astro voice, secondary. We have you in sight visually; you have three good chutes at this time.

21 17 11 ACDR Roger.

21 17 12 DMP What's the altitude?

21 17 13 ACDR Okay. We're at 2000 feet, Deke.

21 17 15 DMP Okay.

21 17 17 REC New Orleans, Recovery.

21 17 18 ACDR ... circuit breaker - -

21 17 19 REC The latest bearing is 025 degrees; I am on New Orleans 150 degree radial - -

21 17 27 ACDR ... what the hell's the - -

21 17 28 REC - - 5.5 nautical miles.

21 17 29 ACDR ...

21 17 30 NEW New Orleans; roger. Out. And we have a good picture. Over.

21 17 31 DMP You got everything?

21 17 32 ACDR Yeah.

21 17 33 DMP Okay.

21 17 34 REC This is Recovery. Roger.

21 17 35 CMP Just give me a hack - -

21 17 36 ACDR - - four PITCH and YAW, OPEN.

21 17 37 DMP Got them.



21 17 38 ACDR Okay. Okay. Reverified AUTO and LOGIC, up. Okay.  
21 17 41 DMP/CMP (Coughing)  
21 17 43 SWIM New Orleans, this is Swim. I have a beacon - -  
21 17 45 DMP Anybody check those sea lights?  
21 17 47 CMP Okay. Let's get it on right now.  
21 17 48 SWIM - - bearing 200; I'm on 020 at 13.  
21 17 50 CMP Got it.  
21 17 51 ACDR Okay, come up on - -  
21 17 52 NEW New Orleans; roger. Out.  
21 17 53 CMP Okay, 800 feet.  
21 17 54 DMP 800 feet? Okay.  
21 17 55 ACDR Hey, guys. Stand by for splashdown.  
21 17 57 ACDR CABIN PRESSURE RELIEF valve, CLOSED, latch; DIRECT O<sub>2</sub> valve - -  
21 18 01 REC And Swim has a tally on the command module - -  
21 18 03 ACDR - - MAIN BUS TIES are coming off, ready? MAIN - -

END OF TRANSCRIPTION

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